



REPORT

OF THE
**RAILWAY ACCIDENTS
INQUIRY COMMITTEE**
1968

PART-II

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	PAGE Number
CHAPTER I	
<i>Introductory</i>	1
CHAPTER II	
<i>The Human Element</i>	
Significance of the human element	5
Discipline and morale of staff	5
Factors affecting discipline—discipline and safety	5
Factors affecting morale of officers and supervisors	7
Trade Unions	8
Functioning of trade unions	8
Plurality of trade unions	8
Outsiders as union office-bearers	9
Sectional (Category-wise) unions	10
Supervisors as members of the union	10
An Association for supervisory categories	11
Welfare Organisation	11
Trade unions sponsoring cases of individual staff	11
The existing Welfare Organisations on the Railways	13
Welfare bureaux of a new pattern	14
Training of Welfare Inspectors	14
The effect of outside interference	14
The role of the Vigilance Organisation	16
Impact of Vigilance on the initiative of the executives	16
Internal Vigilance versus outside 'policing'	19
Disciplinary Procedure	22
The growth of Article 311 of the Constitution	22
Special Inquiry Officers	27
Status and grades of supervisors	27
Loss of self-confidence among supervisors	27
Reservation of posts for scheduled castes and scheduled tribes	30
The calibre and position of railway officers	32
Officer-staff and supervisor-staff ratio	24
The burden of paper work	35
Utility of consultancy	35
Devolution of authority and delegation of powers	36
Railway Labour Science Research Institute	36
CHAPTER III	
<i>Training of staff</i>	
Training schools—capacities and facilities	38
Training of staff in the maintenance and operation of modern sophisticated equipment	38
Training of signalling staff	39
Staff for maintenance of electric locomotives, traction and other electrical equipment	41

Staff for maintenance of diesel engines	41
Training of diesel and electric locomotive drivers	42
Staff for mechanised inspection and maintenance of track	43
Staff to operate ultrasonic testing equipment	43
Personnel of the stores department	43
Refresher training	44
Training of supervisors	44
Training of officers	45

CHAPTER IV

Other staff matters

Recruitment procedure and the Railway Service Commissions	46
Delays involved in selection of candidates	46
Qualifications for recruitment to certain categories of technical staff	47
Housing accommodation for essential staff	48
Overtime working of staff	51
Hours of duty of running staff	51
Duty hours of station masters and assistant station masters at stations manned by one station master and one assistant station master	52
Running Rooms	54
Uniforms	54

CHAPTER V

Rules, Rule Books and Manuals

General Rules	56
Bilingual Rule Books	57
Unified manuals	57
Hand Books	57

CHAPTER VI

Permanent Way

Rails	60
Welding of rails	60
Sleepers and fastenings	61
Track maintenance	62
Engineering 'renaissance'	63
Ballast and ballast diagrams	64
Unserviceable sleepers in track	64
'Distressed' bridges	64
Gangstrengths	65
Curves	66
Turn-outs	67
Rail failures	67
Towards modernisation of track maintenance	69
Measured shovel packing	69
Directed track maintenance	70
Mechanised maintenance	71
Inspection of track by modern methods	72
Half yearly reports by permanent way inspectors	72
Stores workload	73

CHAPTER VII*Level crossings*

Census	75
Norms for deciding the case for manning an unmanned level crossing or upgrading a manned level crossing	75
Railway Safety Works Fund	76
Warning devices at manned gates	77
Signals at midsection level crossings	77
Barriers at manned level crossings	77
Automatic half-barriers	77
Future policy in regard to new level crossings	78

CHAPTER VIII*Signalling and interlocking*

Role of signalling	80
Visibility of signals	82
Colour light signals	82
Semaphore signals	82
Pre-warning of stop signal	83
Braking distances and sighting boards	83
Braking distance trials and resetting of signals	83
Sighting boards	83
Block instruments	84
Centralised operation of signals and points	84
Panel interlocking	84
Route-relay interlocking	84
Centralised traffic control	85
Track circuiting	86
Track circuits to extend to block clearance points	90
Failure of track circuits	90
Permalloy fish-plates	91
Automatic Train Control	92
ATC on automatic signalling sections	94
Cab signalling	94
Manufacture of electrical signalling equipment	94
Maintenance and inspection of signalling equipment	95
Maintenance	95
Inspection	96
Joint inspections of signals	96
Inadequate telecommunication	96
The financial angle in modern signalling	97

CHAPTER IX*Motive Power*

Steam locomotive sheds	98
Examination and maintenance of steam locomotives	98
Booking of repairs on locomotives	98
Equipment at the incoming inspection pit	98
Execution of repairs	99
Repeated booking register	99
Defects resulting in unsafe conditions	101
Defective wheels or tyres	101

Broken axles or journals	..	..	..	..	..	..	..	101
Handling of locomotives by drivers	..	..	..	..	..	..	..	102
Standard schedules of maintenance	..	..	..	..	..	..	..	102
Running performance of a locomotive	..	..	..	..	..	..	..	102
Steam locomotive workshops	..	..	..	..	..	..	..	103
Capacity for periodical overhaul	..	..	..	..	..	..	..	103
Machines and equipments	..	..	..	..	..	..	..	103
Testing of springs	..	..	..	..	..	..	..	104
Balancing the weight of engines	..	..	..	..	..	..	..	104
Ultrasonic testing equipment	..	..	..	..	..	..	..	104
Quality control	..	..	..	..	..	..	..	104
Headlights and dimmer switches	..	..	..	..	..	..	..	105
Diesel and electric locomotive sheds	..	..	..	..	..	..	..	105
Diesel locomotives	..	..	..	..	..	..	..	105
Electric locomotives	..	..	..	..	..	..	..	106
Speedometers and speed recording apparatus	..	..	..	..	..	..	..	107
Drivers' vigilance device	..	..	..	..	..	..	..	108
Anti-wheel slip device	..	..	..	..	..	..	..	110

CHAPTER X

Goods and coaching stock

Examination of goods wagons	..	..	..	..	..	..	..	111
Maintenance of goods wagons	..	..	..	..	..	..	..	113
Sicklines	..	..	..	..	..	..	..	113
Examination and maintenance of coaching rakes	..	..	..	..	..	..	..	114
Incidence of damaged coaches due to electrical and mechanical defects	..	..	..	..	..	..	..	115
Coaches marked sick on mechanical account	..	..	..	..	..	..	..	115
Coaches marked sick on electrical account	..	..	..	..	..	..	..	116
Maintonance of electrical fittings in coaches	..	..	..	..	..	..	..	116
Investigation of failures	..	..	..	..	..	..	..	117
Defect investigations	..	..	..	..	..	..	..	117
Modifications	..	..	..	..	..	..	..	117
Equalising beams on IRS metre gauge bogie coaches	..	..	..	..	..	..	..	118
Laminated bearing springs of BOX wagons	..	..	..	..	..	..	..	119
Hot Boxes	..	..	..	..	..	..	..	120
Maintenance of EMU coaches	..	..	..	..	..	..	..	121
Brake power	..	..	..	..	..	..	..	121
Trains on steam traction	..	..	..	..	..	..	..	121
Narrow gauge trains	..	..	..	..	..	..	..	123
Diesel hauled trains	..	..	..	..	..	..	..	123
Marshalling of anti-telescopic coaches on passenger trains	..	..	..	..	..	..	..	123
Goods brakevans	..	..	..	..	..	..	..	123
Carriage and wagon workshops—capacity	..	..	..	..	..	..	..	124
Broken axles and journals and hot axles	..	..	..	..	..	..	..	124
Roller bearing axle boxes	..	..	..	..	..	..	..	124
Machines in workshops	..	..	..	..	..	..	..	126
Examination of coaches after periodical overhaul	..	..	..	..	..	..	..	126
Neutral control examination	..	..	..	..	..	..	..	126
Checks by Neutral Control Flying Squad	..	..	..	..	..	..	..	127
Overaged rolling stock	..	..	..	..	..	..	..	127

CHAPTER XI*Stores*

Shortage of spare parts and stores	129
Inferior quality of tools and stores	130
Manufacturer's markings	132
Procurement of stores through the agency of Directorate General of Supplies and Disposals	132
Advantages claimed on behalf of bulking	135
Powers of purchase of stores	136
Decentralisation of stores	137
Scientific methods of inventory control and materials management	138
Manning of the stores organisation	139

CHAPTER XII*Theft, vandalism and sabotage*

Theft of railway equipment and vandalism	140
Sabotage	141

CHAPTER XIII*The Commission of Railway Safety*

Historical	144
Functions	144
Organisation	146
Inquiries into accidents	147
Inspections	150
Independence of the Commission	152
Commissions of Inquiry	155
Personnel of the Commission and their status	155
Location	157
Annual Report	158

CHAPTER XIV*The Research, Designs and Standards Organisation and its future role*

Genesis	159
The present organisational structure	160
Research	161
Operations research	163
Design	163
Standards	164
Signalling and telecommunications	164
Checks and inspections	165
Consultancy functions	165
Future development	165
Equipment	166
Finance	167
Reorganisation of the R D S O	167

CHAPTER XV*Accident Statistics*

Diagnosis-oriented statistics	168
Uniform basis of compilation of statistics	169
Streamlining the classification	169

CHAPTER XVI

Safety Organisation

Position of safety counsellors	175
Safety camps	176
Safety Model Car	177
High visibility clothing	178
Inspections	178

CHAPTER XVII

Summary of Observations and Recommendations—Acknowledgments

Summary of observations and recommendations	179
Acknowledgments	230

ANNEXURES

I. Statement showing the details of cases of individual staff and matters of a policy nature sponsored by trade unions	232
II. Instances of grievances of station staff brought up by the trade unions and their redress	234
III. Instances of grievances of driving staff brought up by the trade unions and their redress	236
IV. Analysis of expenditure on different types of signalling development works	238
V. Statement showing provision and year-wise programming of track circuiting of block stations on trunk routes, main lines and the branch lines	238
VI. Statement showing the extent of interruption to control communication due to copper wire thefts	239
VII. Statement showing the incidence of coaches marked sick for non-scheduled mechanical and electrical repairs	240
VIII. Statement showing the various mechanical defects for which the coaches were marked sick	241
IX. Statement showing position in respect of execution of ten selected modifications to carriage and wagon components by the Railways	242
X. Statement showing progress of implementation of the recommendations of the Director (Hot Boxes) contained in special investigation report (1968)	244
XI. Performance of D.G.S. & D. regarding coverage and supply against programme indent submitted by the Railways	246
XII. List of equipment required by the R D S O in so far as considerations of safety are concerned	248

APPENDIX

List of places and installations visited and persons interviewed by the Railway Accidents Inquiry Committee (1968)	250
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CHAPTER I

INTRODUCTORY

Part I of the Committee's Report had been devoted mainly to its first term of reference namely, to review the position of accidents on the Indian Railways since the appointment of the Kunzru Committee, in the light of recommendations made by it and their implementation. The subject matter of that part of the Report thus was chiefly an appraisal of the position of accidents and the action taken by the Government in the past few years on the lines indicated by the Kunzru Committee. The second term of reference of the Committee, namely, to suggest measures for further minimising accidents is broader in scope and it is to this term of reference that we now address ourselves.

2. The occurrence of a few serious accidents in somewhat quick succession in the earlier part of 1968 had created considerable commotion in Parliament and the Press of which in a way, the setting up of this Committee was a result. Notwithstanding this background, we had, in Part I of our Report, shown that over the last decade or so, the incidence of accidents had been showing a steady and uniform decline. We endeavoured to bring into perspective the fact that over the past decade or so, the measure of safety in rail travel had, if anything, registered an improvement. Here, once again, we consider it fair to state that the record of safety of rail travel on the Indian Railways must be judged in the context of the task that the Railways are called upon to perform. The net work of the Indian Railways spreads over nearly 59,000 route kilometres. In fact, taking the multiple lines, yards and sidings into account, the track length is about 96,000 kilometres. The traffic density in certain parts of the Railway system is amongst the highest in the world, the throughput on a number of sections exceeding 10,000 tonnes of freight per day and on some over 30,000 tonnes per day besides heavy passenger traffic. In fact, the highest density—on one or two sections of the Eastern Railway—surpasses the figure of 70,000 tonnes. More than 10,000 trains speed out daily of which nearly half are passenger trains. To run these, the Indian Railways deploy a fleet of approximately 12,000 locomotives, some 38,000 coaches and over 360,000 wagons. Over 1.3 million railwaymen toil to perform this gigantic task. This is indeed a sizeable scale of operations and it is in this context that, rightly, the failures and shortcomings of the Railways in any field—and particularly that of safety—have to be judged. The wide canvas of railway operation must be kept in view when we observe that on an average, during the years 1963-64 to 1967-68, some 77 train collisions and 1,000 train derailments took place annually. The object of presenting this picture is to stress that any sweeping generalisations which may be drawn from our observations on specific issues, itemised for the sake of clarity, in the first part of our Report or in this would be unjustified.

3. At the same time, we do not of course wish these remarks to be misconstrued or taken to mean that all is well and that nothing further remains to be done to promote safety in rail travel. Firstly, the speeds on the Indian Railways when compared with those in several advanced countries are comparatively low. In Japan, a speed exceeding 200 kilometres per hour has already been attained and in the United Kingdom research and trials

are in hand to develop speeds upto 240 kilometres per hour. It is generally accepted that the rate of increase in wear and tear is proportionate to the square of the increase in speeds. Secondly, the axle loads on most sections of the Indian Railways are low as compared to the railways in other industrialised countries. With increased axle loads and more intensive operation, the need for attention to the maintenance of track and rolling stock would be greater. The future picture may, therefore, necessitate a higher degree of safety precautions and consciousness than at present. In this context, safety in rail travel is a matter in which the quest will have to be an unending one and the goals such as may be seemingly unattainable. In Part I of our Report, the scope of our examination was necessarily circumscribed by the first of our terms of reference which called upon us to make an appraisal of the action taken on the Kunzru Committee's recommendations. Even so, we had occasion to point out instances in which the action suggested by the Kunzru Committee six years ago had either not been taken or inadequately accomplished and to indicate directions in which the pace of implementation needed to be accelerated. In the paragraphs which follow, we shall endeavour to indicate certain further directions, the action along which ought, in our view, to lead to a still greater degree of safety in train operation.

4. We have, it would be seen, devoted a good bit of this Part of the Report to matters concerning staff. As we had pointed out in Part I of our Report, a substantial number of accidents in all categories is traced to the human element whether it takes the form of forgetfulness, misjudgement, or sheer carelessness. With the rapid development in techniques in recent times, this problem comes to the fore. It is evident that no device aimed at eliminating failure of the human element can be proof altogether against human fallibility. Indeed, elaborate safety devices may "sometimes defeat their own object by inducing too great a reliance in them at the expense of human vigilance". Some recent accidents are excellent examples of how a combination of circumstances and of errors by a group of people acting in unison can set at naught the very best schemes devised to guard against the possibility of mishaps. "In the last analysis", says L.T.C. Rolt, the well known British author in his work 'Red for Danger' which is a chronicle of railway accidents in the United Kingdom over the past century or so, "railway safety still depends as it has always done, upon the skill and vigilance of the railwaymen". Notwithstanding the use of modern technological safety devices, the steps which the Railway administration may take not only to instil a higher degree of safety consciousness in its men but also to raise the general level of morale and keep the sense of duty pitched at a high level will, it is our firm belief, pay rich dividends.

5. It is, perhaps, necessary to state here that at first sight some of our recommendations in the pages that follow may seem to lack any direct connection with the subject of safety. Matters, for instance, like the authority of supervisors, the role of trade unions, the impact of the functioning of the Vigilance organisation on the morale of railwaymen, or the system of procurement of stores and spares, none of which has any direct bearing on accidents may indeed not seem germane to the subject matter of accidents. The lay reader, finding that we have covered such matters, may well think that we have strayed beyond the legitimate field of study set out for us by our terms of reference. To this lay reader, a work of explanation is rightly due.

6. From the very outset we were clear in our minds that if we were to confine ourselves merely to the more direct causes as brought out in the accident enquiry reports our study of the subject would necessarily be superficial and we would be doing less than justice to the railway staff, to ourselves and to those who had entrusted us with this task, and that it behoved us to address ourselves to the more deep-rooted factors which even though largely latent do, in the course of time, give rise to conditions which cumulatively have the effect of eroding whatever makes for organisational and individual efficiency. Organisational efficiency and individual efficiency inevitably react on each other and any drop in one or both would get reflected in the output of any enterprise quantitatively as well as qualitatively; and in an enterprise like the railways the qualitative impact would assuredly be on the safety of rail travel. Indeed we had visualised this at the beginning of our labours and had put this to the Minister of Railways in our first meeting with him. The Minister had been good enough to accept this point of view readily and had agreed that our investigations may cover all matters which the Committee felt had relevance to the problem of safety. It was against this background and understanding that we went into matters whose link with train operation though seemingly indirect is nevertheless, in our view of a basic character. To these matters and particularly the aspects concerning the human element as viewed from a wider perspective, we attach the utmost importance. We are convinced that to the extent to which the railway administration is able to locate and remedy the factors—whether latent or apparent, remote or direct—which give rise to failure of the human element, to that extent a greater measure of safety in rail travel would follow.

7. In saying this, we wish to reiterate what the Kunzru Committee had said in regard to the cost of accidents. These costs are not merely the direct monetary losses suffered by the Railways and the public in an accident but also include the indirect costs resulting from the delay and dislocation of traffic, the diversion of the attention of the administration from their normal duties in respect of train operation and the money, time and attention spent on the inquiries whether conducted departmentally or by Additional Commissioners of Railway Safety or by Commissions of Inquiry. To these costs must be added the sufferings of the victims of accidents and the loss of the fair name of the railways which cannot be reckoned in terms of money. We record this here with a view to striking a note of caution against exaggerated notions of economy which on occasions are apt to assail not merely the railways but even other enterprises.

8. The suggestions contained in the subsequent chapters, it may be observed, emanate primarily as a result of our visits to and inspections of a wide cross-section of railway installations including production units, workshops, locomotive and EMU sheds, sick lines, level crossings, sections of the track, bridges, cabins, signalling devices, control offices, marshalling yards, running rooms and training schools on all zonal Railways and our talks with railwaymen at all levels and of nearly every category. A list of the places and installations visited and of the persons interviewed appears in the Appendix. The ideas which emerged from these visits and talks needed discussion with the technical and administrative heads of the zonal Railways and the production units and with the Railway Board. The Committee were also fortunate in having the advantage of detailed discussions with Col. D. McMullen, till recently Chief Inspecting Officer of Railways of the British Ministry of Transport who visited India early this year at the

invitation of the Committee extended through the Railway Board. A number of former senior Railway officers also gave the Committee the benefit of their experience and mature advice. Wherever technical and other data were available, the suggestions which took shape were correlated to such data. The views expressed and the recommendations made by us have been evolved after sifting the data furnished by the Railway administrations, a study of the evidence collected and on-the-spot checks made in the different fields of railway working combined with the elucidations which the higher echelons of the Railway administrations and the Railway Board furnished to us. We wish to make it clear, however, that no share of the responsibility for these observations and recommendations devolves on any individual who might have given us the benefit of his views.



CHAPTER II

THE HUMAN ELEMENT

9. *Significance of the human element*—The analysis of accidents during the last many years contained in Part I of our Report had borne out amply that a large number of accidents is caused directly by failure of the human element. Even out of the remaining, a good number can be traced indirectly to the failure of staff to carry out properly their duties of maintenance of track, engines, rolling stock or signals. Mechanical devices and safeguards which the railway administration employs in its various fields of operation are primarily intended to guard against such failures. Needless to say, every mechanical device or safeguard has still to rely for its operation or maintenance on the human mind and hand; and unless such mechanical devices and safeguards are operated in the prescribed manner, not only do they become ineffective but on the other hand, their improper operation and maintenance may, at times, endanger safety. It is in this realisation that we approach the subject of the human element from its various angles.

10. Indeed this subject is so wide and many-sided that it may be difficult to lay down parameters and say with any degree of certainty that the aspects beyond those parameters have no bearing on safety. Take for instance the question of discipline of staff. For one thing there is no known barometer of the level of discipline. Even if some empirical method were to be found to measure the level of discipline, we will still be faced with another difficulty namely the extent to which this factor has a correlation-ship with the proneness to cause accidents. We realise these limitations and have accordingly striven to avoid the temptation of getting involved in such exercises as are largely academic in character. Instead, we have preferred to address ourselves to the practical aspects of these matters which in our view fall legitimately within our field of study. In any group of men got together to perform a certain task, unless the standards of service discipline are of a high order, the corporate effort would gradually weaken and each man's laxity will react on the other; the eventual result in any enterprise would be indifferent but in a field of work like railway operation where corporate effort is of the very essence it would be attended with hazard. Understandably, therefore, we have devoted attention to the factors which make for indiscipline and the ways and means to revitalise the sense of discipline. The same processes of thought apply to other subjects like the training of staff, the welfare organisation, the morale of executives and supervisors, the functioning of Vigilance, the housing accommodation for staff, their duty hours and so on with which we deal in this and the succeeding chapters. At the close of this chapter, we also make a brief reference to the large volume of infructuous paper work which has come to be a routine in the working in railway offices and show how by weeding this out, the attention of the administration and the staff can be channelled in more fruitful directions which would not only make railway travel safer but more efficient.

Discipline and morale of staff

11. *Factors affecting discipline—discipline and safety*—In reply to a questionnaire which we had addressed to them, all the Railway administrations stated unanimously that there has been a definite deterioration in discipline among the staff during the recent years. They all agreed that lack of discipline among the staff impairs the efficiency of workers in day-to-day working and in turn affects the safety of train operation.

12. Among the reasons which the Railways set out for the decline in discipline and which find support from the evidence which was led before us during the course of our tours the more important are:—

- (i) The general decline in the law and order situation in the country and the lack of respect for authority which has found an echo on the railways as well.
- (ii) Interference by politicians, Members of Parliament and State Legislatures and influential members of the public in the day-to-day running of the administration which tends to undermine the self-confidence of the executives on the one hand and respect for authority amongst the men on the other.
- (iii) The present manner of the functioning of certain sections of the trade unions which tends to foster a spirit of defiance of authority among the staff.
- (iv) Reluctance on the part of supervisors to take action against defaulting members of the staff which is borne out of a sense of frustration and insecurity widely prevalent among the supervisors.
- (v) Inadequate personal contact and understanding between the officers and other supervisory categories and the staff in their charge. This is ascribed *inter alia* to a highly inadequate ratio between officers and supervisors on the one hand and between supervisors and the staff on the other.
- (vi) The existing disciplinary procedures which are cumbersome and time-consuming and are not conducive to the taking of prompt and deterrent action.

13. We would like to refer here to a counter argument which was advanced during the course of evidence led before us. If it is true that discipline has declined, how, it was asked, is it that the safety record of the railway administration over the past few years has been showing a steady and uniform improvement and furthermore even the overall performance of the railways from the point of view of the operating efficiency achieved and the additional traffic carried has registered an improvement? The argument, we concede, is not without substance. The answer however was provided by one of the Railways in its reply to the questionnaire. This Railway observed that despite the decline in discipline over the years the Railway administration has been able to perform its task fairly effectively by dint of a core of dedicated workers imbued with a high sense of responsibility. This Railway, however, warned that this core of dedicated workers is fast shrinking and is being called upon to take on a much larger share of the burden of work than is humanly possible for it to carry. Unless the forces at work that undermine discipline, this Railway went on to say, are arrested in time and the deterioration in discipline is checked, the functioning of the railways might run into real peril jeopardising both efficiency and safety. We consider that this is a correct appraisal of the situation and could hardly have been described more aptly. The conclusion which emerges and which we are disposed to accept as valid is that while the Railway administrations and their core of dedicated workers have striven hard to increase the measure of safety and to improve their performance generally, the position would have been better and the level of safety and efficiency even higher but for the factors which have affected discipline adversely.

14. *Factors affecting morale of officers and supervisors*—With one solitary exception, all the Railways, in their replies to the questionnaire, endorsed the view that the morale of officers and of supervisory officials in general has suffered a serious decline in recent years. This description of the state of affairs found overwhelming support from the oral evidence of officers and supervisors at all levels. One of the Railways, however, holds the view that there has been no fall in the morale of officers. Even this Railway concedes that the efficiency and independent outlook of officers is often conditioned by outside interference and senior supervisors have the feeling that they are not effective. For this decline in morale, a variety of reasons have been set forth, the more important of which are summed up below:—

- (i) A feeling of insecurity which has taken strong roots amongst officers and supervisors due to the manner of investigation of their actions by the Vigilance department, the Special Police Establishment, etc. They have a feeling that even the legitimate exercise of discretion can come in for questioning long after it was exercised. Even officers of established integrity are not free from this fear and feel that they can be subjected to harassment and persecution.
- (ii) In addition there is a sense of insecurity amongst officers and supervisors to the effect that if any one of them gets into difficulty in the legitimate discharge of his duties, there is no one to help him and there is general apathy and lack of support from those above him. The feeling has also grown that they are not trusted sufficiently as men on the spot should be.
- (iii) There is a widespread feeling among officers and supervisors that their status and grades and avenues of promotion are not commensurate with the workload and responsibilities which they have to shoulder, particularly *vis-a-vis* their counterparts elsewhere.
- (iv) A sense of frustration all round amongst officers and supervisors generated by a feeling of lack of purpose in their work. Most of them feel that though they are overburdened with paperwork there is a sense of total lack of achievement.
- (v) A feeling of discontent among supervisors arising from the present procedure of reservation of posts for scheduled castes and tribes particularly at the stage of promotion to selection posts.

15. In general, it may be stated that factors which generate indiscipline among the staff have an effect on the morale of the executives; whatever engenders one makes for erosion of the other. We, therefore, propose to deal with the twin problems of discipline and morale together under the following heads:—

- (i) Trade Unions;
- (ii) Welfare Organisation—its objectives and functions;
- (iii) The effect of outside interference;
- (iv) The role of the Vigilance Organisation;
- (v) Disciplinary procedures;
- (vi) Status and grades of supervisors;
- (vii) Reservation of posts for scheduled castes and tribes;
- (viii) The calibre and position of officers;
- (ix) Officer-staff and supervisor-staff ratio; and
- (x) The burden of paperwork.

Trade Unions

16. *Functioning of trade unions*—On the role which the trade unions on the railways play in safeguarding the interests of staff, the Railway administrations have given divergent assessments. Some of the Railways stated that the trade unions have generally played a useful role in this behalf and have contributed to industrial peace. All these Railways, however, stressed that the unions should be encouraged to believe that negotiation rather than adjudication is the way to improve service conditions and that unions would do well to play the role of inculcating duty consciousness and a sense of discipline in the rank and file of staff.

17. Some other Railways, however, do not share this view. They consider that the role played by the trade unions on the railways has been unfortunate and that the unions have been fighting only for rights and privileges ignoring the fact that the employees have some obligations too. According to these Railways the trade unions are never disposed to accept the decisions of the administrations which are unfavourable and keep on raising the same matter over and over again violating the spirit of the negotiating machinery. Furthermore, the unions are prone to raise subjects which are expressly excluded from the purview of discussions such as cases affecting individual members of staff and cases of disciplinary action against errant employees. Since in many instances, the unions are, in the end, able to achieve success in the cases which they sponsor, right or wrong, this has the further effect, it was stated, of eroding respect for authority.

18. While we recognise that the main function of the trade unions is to protect the interests of the staff and strive for better working conditions for them, we feel that the unions have an equally vital role to play in inculcating duty-consciousness and a sense of discipline in the rank and file of the staff. It may be that certain sections of the trade unions have not played this vital role successfully. We on our part consider it necessary to emphasise the importance of the dual role which the trade unions are expected to perform and express the hope that this would receive due attention of the office bearers and the members of the unions.

19. *Plurality of trade unions*—Nearly all the Railways expressed the view that the existence of more than one union on a Railway makes the unions adopt irrational and illogical views because of inter-union rivalry. In such a situation, the unions cease to deal with various issues on their merits and instead direct their efforts mainly at gaining control over the men. As one Railway put it, each vies with the other in playing to the labour gallery. Apart from this, multiplicity of unions means correspondingly more interference in the day-to-day working of the administration, divided loyalty, lack of harmony and often friction amongst the different groups of staff belonging to different unions thus adversely affecting the interests of the staff apart from its inevitable impact on discipline. The Railways were, therefore, of the unanimous view that there should be only one union on each Railway for all the staff and that this would enable the unions to approach controversial issues in a more rational manner and would impart to the unions more bargaining strength.

20. During the evidence tendered before the Committee, one General Manager and some other officers favoured the existence of more than one union. They expressed the opinion that two unions act as a balancing factor against each other and that if there were one union it may make it difficult for the administration to function smoothly.

21. Barring such isolated opinions, however, the general consensus of evidence of railway officers and supervisors at all levels endorsed the view that plurality of trade unions creates difficulties. In their view, a single union on each Railway would provide an answer to the problem, since all the workers would have to come to one union for the redress of their grievances and the union would not have to waste its energies in competing for votes with rival unions. These views were also endorsed by a retired Chairman and a retired Member of the Railway Board. Even the representatives of the National Federation of Indian Railwaymen favoured the idea of having one recognised union on each Railway on the basis of the verified strength of membership of the unions.

22. We have carefully considered the pros and cons of having more than one recognised union of workers on each Railway and consider that not only from the point of view of discipline among staff and the functioning of the administration but also of the workers themselves, it is advantageous that there should be only one recognised employees' union on each Railway with a recognised federation at the apex. Indeed, the advantage of this has been demonstrated since the derecognition of the second union on many of the Railways after the illegal strike of September 1968. In our tours on the various Railways, we were told by most of the witnesses including the workers themselves that industrial peace has been strengthened since that time and the level of discipline has distinctly improved. We would recommend to the Ministry of Railways to explore ways and means whereby recognition is given to only one trade union on each of the Railways.

23. *Outsiders as union office-bearers*.—In the Railway administrations' view which finds support in the consensus of evidence tendered before us, the participation of outsiders as office bearers of the unions exposes them to the influence, often unscrupulous, of political parties, retards the growth of a healthy trade union movement on the railways and is a source of positive hindrance to the smooth working both of the trade unions and the Railway administration. The Railways, therefore, advocated that the law should be amended to debar outsiders from becoming office bearers of the unions. A retired Chairman and some retired Members of the Railway Board were of the view that only serving employees should be allowed to run the unions since only thus would the employees have a feeling of belonging to the unions and would be amenable to reason.

24. The representatives of the National Federation of Indian Railwaymen during their evidence suggested that the question should be left to be decided by railwaymen themselves and that the question of doing away with outsiders would arise only when it is felt that the present procedure is detrimental to the interests of the trade union movement.

25. Having considered the views expressed by the various Railway administrations and also the opinions expressed by the various parties in their evidence, we feel convinced that the present system leaves scope for non-railwaymen with political leanings and alignments with different political parties to gain control over the trade unions and direct the movement more with the aim of furthering their political ends than in the interest of the trade union movement. We wonder if the time has not come when railwaymen in India can competently manage the affairs of their unions and effectively represent their case in negotiations. If necessary they can take the help of salaried persons on their staff and of paid advisers and consultants. But actual leadership including all office bearers should come from the railwaymen themselves. This process would be facilitated and accelerated

if the Railway administrations create a sense of security among their employees who function as office bearers or enter into negotiations with them. The problem, we understand, is already under detailed consideration in a wider context by the National Commission on Labour and we, therefore, desist from making any concrete recommendations on this point.

26. Sectional (category-wise) unions—We received various representations both in the course of our tours and in our secretariat on behalf of certain sectional bodies representing different categories of railway staff and urging recognition to their unions. Without encumbering ourselves with the question of the aptness of dealing with unrecognised unions, we agreed to listen to their point of view. Having listened to them and considering other evidence adduced before us, it became clear to us that small groups of staff in various categories form their own so-called sectional unions and the office bearers of such unions push forward matters of various sorts for discussion with the administration. Several officers told us that even though such unions have not been recognised, consideration of representations put forward by them results in the loss of a lot of time. Often there are clashes of interest among them. We are therefore convinced that if the trade union movement on the railways has to grow along healthy lines, there is no place for sectional or category-wise unions in the movement. The union of workers on each Railway should embrace all categories. If there are problems of a sectional nature it is for the union to have its own sectional divisions and to synthesise the interests of the various groups in the union instead of the various sectional groups speaking with different voices. We, therefore, welcome the policy adopted both by the Railway administrations and the recognised unions on the Railways of not favouring recognition of sectional unions.

27. Supervisors as members of the unions—On the question whether supervisors should be permitted to be members of trade unions of workers whose work they are required to supervise on behalf of the administration, the majority of the Railway administrations expressed themselves as definitely not in favour. It was stated on behalf of the Railways that these supervisors are the eyes and ears of the administration and in case they throw in their lot with the rank and file of workers, they would be unable to function effectively as an instrument to enforce discipline and their value to the administration would diminish. A retired Chairman of the Railway Board expressed the view that it is wrong to permit inspectors and supervisors to be members of the unions since they are part of the management.

28. The opposing view-point was expressed by two Railways who favoured the procedure of supervisors being allowed to become members of the unions. In their view, the leadership in trade unions, at present, emerges from the senior supervisors and if they are debarred from joining the trade unions the leadership of the trade unions is likely to pass into less responsible hands.

29. Unfortunately the actual experience of the trade union movement on the Railways does not confirm this view. In practice, it is found that supervisory staff join the trade union movement not so much to guide their deliberations as to ingratiate themselves with the workers out of a sense of insecurity or for advancing their personal interests. The unfortunate feeling of not belonging to the management leads them onto such a course. This alone in our view accounts for the fact that a considerable number of supervisors on each Railway are members of the trade unions even though from the point of view of their service interests, there is little in common

between them and the workers in their charge. We had called for information from the Railway administrations in regard to the number of persons in supervisory posts in grades Rs. 250—380 and above who are members (or were members prior to September 1968) of recognised trade unions. Only four Railways were able to furnish the requisite information in this behalf and we reproduce this below:

Railway	Total number of persons in supervisory posts in grades Rs. 250—380 or above	Total number out (2) who are (or were prior to Sept. 1968) members of recognised trade unions
Northern	3,300	350
North Eastern	1,845	385
Northeast Frontier	1,454	1,047
Western	2,881	2,321

Taking the information furnished by the four Railways as representative, it is obvious that a significant number of supervisors are at present members of the recognised (or erstwhile recognised) unions.

30. We consider that such a situation does good neither to the trade union movement nor to supervisors. Nor are we convinced that in the absence of supervisors, the rank and file of workers would not be able to throw up the right type of leadership for the unions. We consider that the time has come when the law on the subject should be suitably amended so as to debar certain categories of senior supervisors from joining the trade unions of workers. It is our view that staff in senior supervisory posts drawing gross emoluments of Rs. 500 per month or above should not be allowed to become members of recognised unions of railway workers.

31. *An Association for supervisory categories*—These senior supervisors are limbs of the management and like any other category of staff would no doubt need a suitable forum to represent their difficulties and where necessary to take up matters of common interest to them with the higher echelons of the administration on their behalf. Having expressed ourselves against such supervisors becoming members of recognised trade unions, we would favour one separate association on each Railway with a Federation at the apex for all such supervisory categories which should receive due recognition of the railway administration and the respect which is due to it as a body of men who represent the eyes and ears of the administration in the field. Since supervisory staff as junior members of management cannot obviously be allowed to resort to the weapon of strike, it is desirable that some machinery in the nature of arbitration should be instituted by which collective problems concerning such staff which cannot otherwise be resolved should be dealt with.

Welfare Organisation

32. *Trade unions sponsoring cases of individual staff*—We had while referring to the functioning of trade unions remarked that the unions often urge cases affecting individual members of staff even though such subjects

are expressly excluded from the purview of discussion. The plea advanced by the unions for not refraining from taking up such matters is that the welfare of staff is the primary objective of a trade union and that these matters affecting as they do the welfare of individual staff should rightly be within their purview.

33. With a view to ascertain to what extent the unions occupy themselves with such matters, we had asked the Railways to furnish figures of cases of individuals pertaining to transfers, promotions, selections, punishments, leave, increments and other allowances etc. as also of matters of a policy nature which had been raised by the trade unions during the year 1967-68 and the first six months (ending September 1968) of the year 1968-69. The figures furnished by the Railways make interesting reading and we reproduce these at Annexure I. The overall picture which emerges is as under:—

		1967-68	*1968-69 *(For six mon- ths upto Sept- ember, 1968)
(i)	Total number of individual cases of all categories of staff sponsored by trade unions regarding :		
(a)	Transfers	3,152	1,530
(b)	Promotions	1,703	959
(c)	Selections	538	252
(d)	Punishments in (i) accidents cases	225	93
	(ii) other cases	1,423	795
	(e) Leave	1,352	735
(f)	Increments, pay, allowances and other payments	20,261	9,062
(g)	Other cases	11,511	5,380
	Total	40,165	19,696
(ii)	Total number of cases on policy matters sponsored by trade Unions	7,486	3,330
(iii)	Grand Total	47,651	23,026
(iv)	Percentage of item (i) to (iii)	84.3	85.5
(v)	Percentage of item (ii) to (iii)	14.7	14.5

34. It will be seen that for every reference of a policy nature, brought up by the trade unions, there were five to six references pertaining to individuals which the unions have been sponsoring.

35. We would indeed have deplored in strong terms this usage of the unions sponsoring individual cases as also of the Railway administrations allowing a long rope to the unions by entertaining such cases but for the fact that we also found from the information furnished by the Railways in this behalf that in nearly 85 to 90 per cent of the cases of individuals sponsored by the unions, the Railway administrations on examination either redressed the grievances or found that they merited redress. We had, by way of a sample, called for information pertaining to only two categories of staff, namely the station staff and the driving staff. The data has been analysed according to the nature of grievances (which were the subject matter of cases of individual members of staff brought up by the trade unions) under (a) confirmation or fixing of pay or seniority or promotion, (b) sanctioning of increments, (c) payment of arrears of pay, allowances etc., (d) sanctioning of Provident Fund loans etc., (e) granting of loans,

(f) issue of passes and P.T.Os, and (g) sanctioning of pension or payment of pension or Provident Fund. We find that in nearly 85 to 90 per cent of cases, the Railway administrations found that the cases of grievances brought up by the trade unions merited redress. Of a total of 17,851 such cases which the unions sponsored in the 18 months ending September 1968, 15,408 were either redressed by the time the information was furnished to the Committee or had been found to be meriting redress. Separate statements pertaining to station staff and driving staff, as furnished by the Railways are at Annexures II and III.

36. It will also be seen from these statements that of the grievances which figured most among the cases sponsored by the trade unions, both in respect of station staff and of driving staff, the top three places are taken by (i) payment of arrears of pay, allowances etc., (ii) sanctioning of increments and (iii) confirmation of fixing of pay or seniority or promotion, in this order. This we consider doubly unfortunate since a properly managed Personnel Branch, even if it were not welfare oriented, ought certainly to be able to take care of these matters so that the staff do not have occasion to complain, much less feel the need of channelising these matters through the trade unions. We have no doubt that in many of such instances, the staff resorted to representation through the trade unions after they had lost hope of getting what was due to them through normal channels. This, therefore, brings us to the question of an organisation within the railway administration to attend to such matters.

37. *The Existing Welfare Organisations on the Railways*—Each Railway Administration has an organisation called the 'Welfare Organisation' whose duties among other things consist in bringing to the notice of the proper authorities the genuine difficulties and grievances of the staff and to help to resolve them expeditiously. The Welfare Organisation is under the overall charge of the Chief Personnel Officer who is assisted by a Personnel Officer (Welfare) and Welfare Inspectors at the headquarters office. On the divisions and in the workshops, the Divisional Personnel Officers and the Assistant Personnel Officers look after welfare activities and are assisted by Welfare Inspectors. Besides attending to grievances, the Welfare Organisation is required to keep a watch on the proper functioning of various schemes and establishments set up for the welfare of staff as for example railway hospitals, schools, institutes, canteens etc. They are also expected to encourage thrift among the staff and to promote Co-operative Societies as well as sports, scouting and youth movements. In reply to a questionnaire which we addressed to the Railways, a number of Railways stated that the existing set-up of the Welfare Organisation is inadequate to fulfil the various objectives and functions set for it. One Railway suggested that the activities of the Welfare Inspectors should be widened so that the staff could look forward for advice, guidance and help even in personal affairs. Another Railway thought that the image of a Welfare Inspector to the staff should be that of a "benevolent somebody in the Organisation", to whom the staff could look up to bring sympathy and justice.

38. These are all laudable objectives and we wish the position were so; but confining ourselves, for the present, to the removal of genuine grievances, we have seen that the role played by the Welfare Organisation has evidently been ineffective. No wonder, therefore, the Welfare Organisation has not succeeded in bringing contentment to the employees in so far as the redress of their individual grievances is concerned. Were the existing Welfare Organisation able to cope with the task of redressing the genuine grievances and difficulties of the staff, they would not only justify their

existence but what is more important would make the staff on the line feel that there is someone to attend to their difficulties and that the administration is not an impersonal unsympathetic structure but one anxious to give them their due.

39. *Welfare bureaux of a new pattern*—It was, therefore, a refreshing experience for us when we were explained or shown the working of some revitalised welfare bureaux in some of the divisions of the Railways particularly Asansol, Kharagpur and Baroda. We were gratified to see the keen interest the Divisional Superintendents were personally taking in them. The broad features of the revitalised welfare organisation in these divisions were more or less common, namely, that any member of the staff who had a grievance or difficulty whether in respect of payment of dues or issue of passes or sanction of leave etc. could come to the counter of a well-appointed tidy-looking Welfare Bureau where neatly dressed, attentive looking Welfare Inspectors and staff attended to them immediately. On registering the grievance, the Welfare Inspector at the desk would set about finding the position in regard to the grievance or difficulty from the Branch concerned. The employees would either get the final reply the same day or an interim reply and an assurance that a reply would follow within five days or a week. The matter would thereafter be followed up until it was finalised. The Divisional Superintendents told us that the assurance given was fulfilled and that they personally watched the position.

40. In our discussions with the Board, we were told that this new pattern of the Welfare Bureaux has been set as a model to be adopted or even improved upon by all the divisions and the idea has caught up firmly and is being established. This is indeed heartening and we hope that the time will soon come when the staff all along the line feel that if they have some grievance or difficulty, it is the Welfare Inspector to whom they should address it.

41. *Training of Welfare Inspectors*—We might add here that one of the Railways had stated that orientation training to the Welfare Inspectors is very essential and that this orientation should include the philosophy of welfare, a study of human resources, working of group activities, the essential aspects of labour legislation and establishment rules. The Railway also suggested to us that in this matter, the assistance of Institutes like the Tata Institute of Social Sciences and the Labour Institute at Bombay and other experts in the field of Welfare and personnel management should be freely sought. We hope the Railway has succeeded in giving a concrete shape to the scheme which is visualised. We commend to the authorities the imparting of such orientation to the Welfare Inspectors so that they are able to accomplish what their functional designation implies.

The effect of outside interference

42. We had in Part I of our Report occasion to mention that interference by outsiders in day-to-day working is a source of considerable frustration and lack of self confidence amongst executive officers, and had stated that factors like this inevitably tell on the morale of officers and their disposition to take right decisions. In the course of our tours we found overwhelming evidence of large-scale outside interference in day-to-day decisions pertaining to transfers, promotions, postings, seniority, fixing of pay and other routine matters which acknowledgedly ought to be outside the

sphere of influence of politicians. When such interference becomes a common occurrence known to yield results, the staff come to believe that securing the assistance of an influential outsider is the only means available to obtain what they are aiming at instead of looking up to their immediate superior; on the other hand the executive officer who is, in his day-to-day work called upon to take routine decisions of this nature has a feeling that even the most bonafide of his decisions may be called in question and set aside if it is unpalatable to a member of the staff having influential connections. This state of affairs has thus the dual effect of creating indiscipline in the staff on one hand and a decline in the morale of executive officers on the other.

43. As to the extent to which outside interference has permeated the domain of staff management on railways, we received ample demonstration when on a day on which we were to record the evidence of a Divisional Superintendent of a certain Railway, this officer showed us three letters which he had received in the day's dak from his headquarters office. These three letters were dockets of three communications, from Members of Parliament addressed to the Ministers of Railways seeking their intervention in matters like transfer of an assistant station master and some other paltry matters. The Ministers apparently had, in each of the three cases, asked for report and in due course the letters had trickled down to the Divisional Superintendent asking for 'immediate attention' and report. The Divisional Superintendent complained that such matters were strictly within the competence of his officers and outside interference of this nature, by loading the officers with such infructuous work, prevented them from carrying out their supervisory duties. He further told us that there was nothing unusual about his having received three letters on one day and that he received similar communications often.

44. Even in our discussion with the Board, this story was repeated to us and we were told that some 900 letters or so were received from Members of Parliament every month on matters of transfers, promotions, etc. which the Board had to look into. A retired General Manager while referring to this phenomenon stated that "incredible things are done in this way and unless the Minister has the backing of his constituency he would not be able to stand up to this".

45. We have no doubt in our mind that the authors of these communication whether Members of Parliament or other public figures, do so without realising the repercussion of their intervention on the discipline of staff and the morale of officers. Nonetheless the evidence which we have referred to speaks volumes for the magnitude of the problem.

46. The Kunzru Committee had expressed the hope that Members of Parliament would bear this in mind and do what they can to promote discipline. Much as we would like to cherish similar hopes, we find it hard to be optimistic that Members of Parliament would abstain from writing to officials at all levels on matters concerning individual members of staff. Even assuming that some Members of Parliament may heed our appeal, we do not think the dimensions of the problem would be much reduced. We would therefore like to go a step further and appeal to the Ministers that they should do all they can to withstand such pressures and endeavour to insulate the officers within their charge from outside influence. We have every hope that the Minister of Railways would be equally anxious to sustain the morale of his officers and would set precedents whereby such intercessions are eliminated.

47. It would, we consider, be a healthy practice if the Minister of Railways were to lay on the table of both Houses of Parliament every quarter a statement giving the details about letters and representations of this nature received by him from Members of Parliament and indicating what, if any, action has been taken on them.

48. A more radical and fundamental method of eliminating political influence in such matters may be to convert the Railway Board into an autonomous statutory corporation as is the case in the United Kingdom. It is not, however, within the purview of this Committee to investigate into the pros and cons of this proposal and to pronounce on its desirability.

The Role of the Vigilance Organisation

49. *Impact of Vigilance on the initiative of the executives*—At the outset, we would like to observe that of all the matters having a bearing on the subject of morale, the one subject on which the evidence of railway officers and senior supervisors has been the most overwhelming and unreserved is the functioning of the Vigilance organisation and its impact on the sense of self-confidence of the executives in the field and their decision-making process.

50. It is unnecessary for us to recount the evidence which was tendered before us by all categories of officers from General Managers down to senior supervisors. It was stated almost universally that the Vigilance organisation as it functions today has the effect of killing or at least considerably weakening the initiative and disposition to take the right decisions, creating a fear complex, a general shirking of responsibility all around and a tendency to pass the buck upwards. The Vigilance-surcharged atmosphere, we were informed, compels officers and supervisors to play safe at any cost, including that of efficiency and to the detriment of the best interests of the Railway administration.

51. A General Manager put it in these words: "The whole philosophy of Vigilance is based on distrust even at the highest level and this is tending to make the administration static and rule-bound; the functioning of the organisation is hardly serving any purpose. It leads to little progress or results. Efficiency is going down and everybody is trying to save his skin and is shirking responsibility." Another General Manager observed that the Vigilance organisation in the present form is 'an unmitigated evil' and ".....the sooner it is scrapped, the better it would be."

52. The representatives of the Federation of Class I Railway Officers' Association stated in their evidence that quite apart from the fact that those involved in Vigilance investigations undergo a lot of indignities and mental and financial strains, even in cases where the investigations bring out nothing unfavourable, the officer remains under a cloud until the Central Vigilance Commission has endorsed the clearance. It often takes two or three years before the officer is finally exonerated but in the process the harm it has done cannot thereafter be undone. "In these conditions", the Federation went on to say, "the Railway Administration cannot be expected to produce results."

53. In saying all this, we are, if anything, understating what came out in evidence. Metaphors like 'Gestapo', 'cancer', 'octopus', 'wolf' were used by some very responsible witnesses in likening the functioning of Vigilance. We deem it fair to state that these witnesses had not distinguished themselves by the use of intemperate expression when tendering their evidence on matters other than Vigilance, but when it came to Vigilance, their voices were charged with agitation and a perceptible quiver which we did not fail to note.

54. This universal feeling received equally strong support from the evidence of a retired Chairman and several retired Members of the Railway Board. Even in our discussions with the Railway Board, we found that they were in complete agreement with the views expressed by officers and they did not mince words.

55. The thing that surprised us further was that the feeling of extreme insecurity which the working of the Vigilance organisation has engendered has permeated down even to the lowest level. A wayside station master told us that even at the time he is doing line-clear working, he has a lurking fear that somebody might be watching him and might catch him on some trumped up charge. Some Permanent Way Inspectors told us that not infrequently, Inspectors of the Vigilance department (and at times even of the Special Police Establishment) come and swoop down on them without notice and start checking up their stores and other things. They make enquiries of various sorts from the Class IV staff subordinate to them posted in and around the place. After the Vigilance batch had gone, a PWI told us, he heard nothing about the matter for months, but the worry and the disgrace remained. Another PWI told us that a trolley accident was caused through inattention due to worry on this score.

56. It is against this mass of denunciatory evidence that we felt called upon to have the version of a senior spokesman each of the Vigilance side and of the Special Police Establishment. Curiously, the spokesman of the Vigilance side maintained that the working of Vigilance is in no way responsible for the loss of morale and that the Vigilance organisation helps the officers who are otherwise overburdened to carry out preventive checks and to that extent it helps them to do their job better and to raise their morale. The spokesman of the Special Police Establishment, in his evidence took the position that any talk that the functioning of his Establishment has the effect of demoralising the officers is nothing but "propaganda done by dishonest officers". When we told him of the surprise checks which the teams of the Special Police Establishment make on the activities of the supervisors on the Railways and asked him on what basis the checks were made, he told us that though the Act of Parliament under which the Special Police Establishment was set up did not provide for any such checks, some preventive checks had been made off and on by his men. He, however, told us that such preventive checks had since been stopped and the Special Police Establishment now confine their activities only to investigations.

57. Frankly, we remain quite unconvinced with the logic of the spokesmen of the Vigilance side and of the Special Police Establishment. In our view, if what they stated is not a routine departmental defence, the only interpretation that we can place on it is that it reflects a total unawareness of reality.

58. We also considered it appropriate to go into the question of the relationship between the Vigilance wing of the Railway Board and the Central Vigilance Commission which was constituted under a Resolution of the Government of India. We find that while according to this Resolution, the Central Vigilance Commission has jurisdiction and powers in respect of all public servants who may be suspected of or alleged to have acted for an improper or corrupt purpose, by convention the Central Vigilance Commission confines itself to cases involving only gazetted officers. In respect of officers, however, we were told that all cases relating to officers in which investigations have been made must go to the Central Vigilance Commission for opinion even if the investigations have *prima facie* brought out nothing. Once a case has been registered for investigation against an officer, it cannot be closed until the Central Vigilance Commission has endorsed the opinion of the Ministry that the investigations have not brought out anything actionable. Should the investigation reveal anything actionable, the Central Vigilance Commission also determines whether a charge-sheet is to be issued to an officer and whether it should be for a major or a minor penalty. Furthermore, should the Central Vigilance Commission recommend an inquiry, such inquiry is ordinarily made by a Commissioner of Departmental Inquiries who is usually someone with no background of the railways. Eventually, when the competent authority decides to impose a penalty on an officer, it is done with the concurrence of the Central Vigilance Commission. It has been provided that should the Government not accept any of the recommendations of the Central Vigilance Commission the latter would incorporate this in its annual report to the Ministry of Home Affairs who in turn are required to lay it before each House of Parliament. In practice, there has been no case in which a recommendation made by the Central Vigilance Commission has not been accepted by the Government.

59. With such wide coverage and powers, it is not difficult to see that there should be inevitable delays in the handling of cases in the office of the Central Vigilance Commission. We were told that even in cases where nothing *prima facie* has been found, it sometimes takes months before the Central Vigilance Commission can give its clearance. In many cases, there have been much longer delays. Meanwhile, according to the existing procedure, any officer against whom an investigation has started, is debarred from promotion if due and cannot be empanelled for a higher appointment. If such an officer were due to retire, the retirement benefits are withheld. Furthermore, no matter how discretely and confidentially these investigations may be conducted, it soon becomes common knowledge that investigations are proceeding against the officer. Having thus come under a cloud, the officer is thereafter unable to function effectively which is hardly surprising. Even if eventually such an officer is cleared, the psychological damage done to him is permanent and irretrievable.

60. What is stated in the above paragraphs is for officers who may be actually involved in Vigilance cases; but no less damage is being caused to the others who may not be so involved actually. In the present conditions, unless an officer has extraordinary grit, he is reluctant to act on his own responsibility even where the rules provide for discretion and he endeavours wherever possible either to switch on the responsibility to a colleague or a superior or at least share the responsibility with others. Engineering officers show hesitation in working out a settlement of disputed matters with the contractors lest motives should be imputed to them and instead prefer suggesting the course of arbitration which results in disputes remaining unsettled for long durations. Stores officers prefer not to exercise their power

of direct purchase from the market even in an emergency and prefer calling for tenders and involving a number of officers including a representative of Finance in the transaction. "Pass the buck" and "Save your skin" have thus become the overriding precepts in utter disregard of the interests of the administration.

61. A highly unfortunate though a less known feature of Vigilance in its present form has been the deployment of a group of so called "sources" who operate as informers of the Vigilance department. Needless to say, the Vigilance department does not flourish on information supplied by persons having the noblest of motives. Mostly persons frustrated in their own profession and with unscrupulous, spiteful and other sinister motives put on the garb of informers. What is worse, such individuals are often employed to shadow officers and staff incognito. For an officer, the thought that he may be shadowed by such characters is demoralising enough. In fact, according to the information available with us, a good number of informers of the Vigilance department are from among the Railway staff and some who are outsiders function as regular professional 'sources'.

62. The system of informers makes a mockery of the so-called directive which we were told, the Vigilance Organisation strictly follows, namely, that no notice should be taken of anonymous or pseudonymous complaints. If an individual can remain incognito and yet place himself in such a position that the Vigilance department will act on the information supplied by him, we do not see what is achieved by ordaining that no notice would be taken of anonymous complaints.

63. *Internal Vigilance versus outside 'policing'*--The commonly understood and generally accepted connotation of the word 'Vigilance' as applying to the working of public servants is the prevention of corrupt practices and maintenance of high standards of personal integrity. Even among those who denounced the working of Vigilance in strong terms, it was no one's case that corruption or other malpractices do not exist or should not be put down with a heavyhand. On the contrary, every witness from top to bottom with whom we discussed this subject, stated with one voice that not only must their own actions be above board but it is their duty to ensure that every one in their charge maintains the highest standards of integrity in all official dealings. What they, however, complained against was that whereas Vigilance, in the real sense of the term, should be built into the organisation and every head of department and every senior officer should be the Vigilance head of his own department or branch, what has happened is that a body had grown from outside and had gained a stranglehold over the railway organisation. Investigations against the staff now get started without the knowledge of the controlling officers and against officers, often without the knowledge of the General Manager, or the Member of the Board concerned. By the time the controlling officer, the General Manager or the Member of the Board concerned come to know of this, it is too late to undo the damage that has been done.

64. The Vigilance organisation in its present form owes its existence to the recommendations made by the Santhanam Committee. The terms of reference of this Committee did not have particular reference to the Railways. The Committee had nonetheless devoted special attention to the working of Vigilance on the Railways and had gone on to suggest a vast Vigilance set up including a Member (Vigilance) on the Railway Board itself. Eventually, the organisation in the Railways which emerged as a result of these

recommendations was an Additional Member, Vigilance (now called the Director General, Vigilance) assisted by a number of Joint Directors, Deputy Directors, Assistant Directors, Officers on Special Duty, etc. The Director General (Vigilance) though nominally under Member Staff, Railway Board, in effect directs the whole of the organisation and exercises control over the Vigilance wings of the Railway administrations.

65. Prior to the recommendations of the Santhanam Committee, the anti-corruption work on the Railways was mostly an internal matter. The Kripalani Committee on Corruption in the Railways had in its Report observed as under:—

“Officers at the top should be made to realise that their duty does not end by merely being above board themselves. It is also part of their duty to see that the staff working under them are efficient and honest.”

66. In other words the prevailing thought until the Santhanam Committee's Report came was that Vigilance was something inherent in an organisation and that the Railway administration and the respective Heads of various Departments were required to be the Vigilance officers of their organisations. Once this scheme of things was disturbed and 'Vigilance', instead of being an internal organ, took on the role of "policing", as a very senior representative of the Railway organisation described it, things became different. This officer told us in his evidence that even "Manusmriti provides for corruption and how to deal with it. There are certain inbuilt checks in the administration..... But you are trying to build a new organisation—another organisation which has come up and is called Vigilance....."

67. Here then is an organisation in which an employee's controlling officer has no say in the matter, in which the head of the department is not consulted when an investigation is taken in hand against a responsible supervisor and in which a case begins to be built up against an officer who may have put in long and loyal service on the complaint of an unscrupulous informer without the General Manager and the Member of the Railway Board concerned being taken into confidence. We have little doubt in our minds that whatever little good such an organisation may have accomplished in isolated cases would indeed be hardly a speck against the enormous harm which it has succeeded in doing all around.

68. We have been at considerable pains to set out the background in which the question of functioning of Vigilance engaged our attention and having expressed our misgivings about its role in its present form, we cannot help observing that without any further loss of time, steps should be taken by the Government to undo the damage which has been done by this highly ill-conceived plan of action which it might have once been thought would root out corruption but which instead is throttling the healthy organism of the Railways. We would suggest action along the following lines:—

- (i) While nothing must be left undone to root out corruption, in whichever quarter it may exist, it should be understood that this duty devolves squarely on the Railway administration itself and not on any organisation which has the semblance of an outside policing organisation. It equally devolves on the administration to protect honest and innocent officials from allegations by unscrupulous persons who may be nurturing grievances against their superiors or fellow-workers.

- (ii) No investigation should be taken in hand against any railway official, including a gazetted officer, without the concurrence of the Head of the branch or of the organisation corresponding to the status of the official against whom there is a complaint. While we would like to leave the procedure in this behalf to be settled by the Railway administration, we would, as a broad guide line, suggest that for a class III employee other than a senior supervisor, the concurrence of the Divisional Superintendent (or an authority of an equivalent rank in the case of other than the divisional employees) should be obtained. For investigations against a senior supervisor, the prior concurrence of the Head of the Department concerned should be taken. In respect of an officer working on a Railway administration, the General Manager should be taken into confidence besides obtaining the concurrence of the Member of the Railway Board concerned. In seeking such concurrence, all the material available on the basis of which the case for investigation is sought to be made out should be placed before the competent authority and if the latter after considering the material finds that there is no case for investigation, the matter should not be pursued further and the discretion so exercised should not ordinarily be questioned.
 - (iii) While we commend the directive that no notice must be taken of anonymous or pseudonymous complaints, we are of the view that the purpose behind this directive is set at naught by initiating investigations on 'source' information. We deprecate the practice of accepting such information. Such information should, except in extraordinary circumstances, not be given any credence. Only in very exceptional circumstances and that too when the authority competent to give concurrence for initiating investigation has personally satisfied himself as to the antecedents and motives of the informer may notice be taken of such information.
 - (iv) In the Railway Board, the Directorate of Vigilance should be headed by a railwayman of considerable experience and proved integrity who should have the rank of a Director functioning directly under the Member Staff. We do not consider that there is any justification for the post of Director General (Vigilance).
 - (v) In the Vigilance organisation, both in the Railway Board's office and in the Railway administrations, the lower officers and inspectors should all be railwaymen having excellent record and reputation for integrity and a flair for investigation. In our view, the police inspectors and officers who have little knowledge of railway working and who, in an organisation like the Railways would have problems of adjustment, do not have any utility in the Vigilance organisation.
 - (vi) We welcome the assurance given to us by the representative of the Special Police Establishment that preventive checks not based on any specific complaints have been discontinued. We wish to record that such checks do not serve any purpose and if these have been discontinued, these should not be reviewed.
69. In the end, we would like to commend for the consideration of the Central Vigilance Commission a thought which we have no doubt would be

received by that authority in the spirit in which it is offered. We would suggest a self-imposed ordinance by the Central Vigilance Commission that only cases of officers in the Senior Administrative grade and above should be scrutinised by the Commission. Cases of other officers should be left to be dealt with by the Ministry of Railways themselves. Such a course, we are sure, would enable the Central Vigilance Commission to give closer and more prompt attention to the cases handled by it. This would also, assuredly, go to build up the morale of railway officers.

Disciplinary Procedure

70. In Part I of our Report we had stated that the present disciplinary procedure based on Article 311 of the Constitution is by its nature cumbersome and time-consuming. The evidence which we heard in the course of our tours highlighted this fact and it was repeatedly urged before us that the procedure for taking disciplinary action should be simplified so as to make it possible to mete out prompt and deterrent punishment to errant employees.

71. It was suggested in the course of evidence that the railway staff should be treated on a par with the defence personnel and should be subjected to military discipline and rules, that action arising out of accident cases should be processed on a summary basis, and that the erstwhile rule in the Establishment Code (R.I. 149) which empowered the General Manager to discharge a railway employee by giving a month's notice—a rule which had been struck down by the Supreme Court—should be restored.

72. We, therefore, had a close look at the Discipline and Appeal Rules and at Article 311 of the Constitution on which these are founded. These rules aim at providing adequate opportunity to the employee along the lines envisaged in Article 311 before any of the major penalties can be imposed on him. To go into the history and growth of the protection which the concept 'adequate and reasonable opportunity' affords and which in due course came to be enshrined in our Constitution would be of interest.

73. *The growth of Article 311 of the Constitution*—Going back some fifty years ago, the relevant provisions governing civil servants were set out in Section 96(B) of the Government of India Act, 1915 (as amended in 1919) and read as under:—

"96B(1) Subject to the provisions of this Act and of rules made thereunder, every person in the civil service of the Crown in India holds office during His Majesty's pleasure, and may be employed in any manner required by a proper authority within the scope of his duty, but no person in that service may be dismissed by any authority subordinate to that by which he was appointed, and the Secretary of State in Council may (except so far as he may provide by rules to the contrary) reinstate any person in that service who has been dismissed."

* * *

(2) The Secretary of State in Council may make rules for regulating the classification of the civil services in India, the methods of their recruitment, their conditions of service, pay and allowances, and discipline and conduct. Such rules may, to such extent and in respect of such matters as may be prescribed, delegate the power of making rules to the Governor-General in Council or to local governments, or authorise the Indian legislature or local legislatures to make laws regulating the public services."

74. The effect of this provision was that even while the English Common Law whereby every government employee held office during the Crown's pleasure was statutorily recognised, he could not be dismissed by an authority subordinate to that by which he had been appointed. Moreover, the proviso "subject to the provisions of the Act and the rules made thereunder" occurring at the commencement of the Section provided a further protection guaranteed by the rules issued from time to time. Rule 55 of the 1930 Classification Rules issued in pursuance of the said Act provided that no order of dismissal, removal from service or reduction in rank could be passed on a member of a service (other than an order passed on facts which had led to his conviction in a Criminal Court or by a Court Martial) unless he had been informed in writing of the grounds on which it was proposed to take action and had been afforded an adequate opportunity of defending himself.

75. It may here be observed that railway servants were as a class governed by a separate set of rules collected in two volumes of the Indian Railways Establishment Code. These were, however, similar to and in terms pari materia with, the 1930 Classification Rules.

76. Then came the Government of India Act, 1935. Of this, section 240 provided as under:

- "240(1) Except as expressly provided by this Act, every person who is a member of a civil service of the Crown in India, or holds any civil post under the Crown in India, holds office during His Majesty's pleasure.
- (2) No such person as aforesaid shall be dismissed from the service of His Majesty by any authority subordinate to that by which he was appointed.
- (3) No such person as aforesaid shall be dismissed or reduced in rank until he has been given a reasonable opportunity of showing cause against the action proposed to be taken in regard to him."

77. A comparative reading of the relevant provisions of the 1915 Act and the 1935 Act would show that the latter Act not only maintained the earlier guarantee that no government servant would be dismissed by an authority subordinate to that by which he had been appointed, but went a step further and gave statutory shape to the affording of 'reasonable opportunity' to the employee which until then had been governed merely by subsidiary rules.

78. It is noteworthy here that whereas the rules had prior to 1935 laid down that the employee must be afforded adequate opportunity of defending himself, the provisions of the 1935 Act laid down, 'that a reasonable opportunity of showing cause against the action proposed to be taken' must be given to the employee. This thus made the issue of notice to show cause against the proposed punishment to the accused employee a statutory obligation.

79. Finally, in 1950, came our Constitution. The provisions of Article 310(1) and 311(1) and (2) which are relevant for this purpose and which correspond to Section 240 of the 1935 Act are as under:

- "310. *Tenure of office of person serving the Union or a State*—(1) Except as expressly provided for by this Constitution, every person who is a member of a defence service or of a civil service of

the Union or of an all-India service or holds any post connected with defence or any civil post under the Union, holds office during the pleasure of the President, and every person who is a member of a civil service of a State or holds any civil post under a State, holds office during the pleasure of the Governor of the State.

* * *

"311. Dismissal, removal or reduction in rank of persons employed in civil capacities under the Union or a State—(1) No person who is a member of a civil service of the Union or an all-India service or a civil service of a State or holds a civil post under the Union or a State shall be dismissed or removed by an authority subordinate to that by which he was appointed.

(2) No such person as aforesaid shall be dismissed or removed or reduced in rank except after an inquiry in which he has been informed of the charges against him and given a reasonable opportunity of being heard in respect of those charges and where it is proposed, after such inquiry, to impose on him any such penalty, until he has been given a reasonable opportunity of making representation on the penalty proposed, but only on the basis of the evidence adduced during such inquiry."

80. Two things are noteworthy on a reading of these Articles. Firstly, whereas Article 310 refers to various services including defence service, Article 311 omits mention of defence service. Secondly, Article 311(2) states that before penalty of dismissal or removal from service or reduction in rank can be imposed on a government employee as defined therein, three separate provisions must be fulfilled, namely

- (a) that there shall be an inquiry in which the person is to be informed of the charges against him;
- (b) that he must be given a reasonable opportunity of being heard in respect of those charges; and
- (c) where eventually punishment is proposed to be imposed on the government servant, he would again be 'given' a reasonable opportunity of making representation on the penalty proposed.

81. This Article, thus, integrates three steps—two of which were provided for by Rule 55 of Classification Rules read under Section 96(B) of the 1915 Act [namely (a) to be informed of the charges and (b) to be given adequate opportunity of defending himself] and the third provided for under Sub-section 3 of Section 240 of the 1935 Act (namely, to be afforded a reasonable opportunity to represent against the penalty proposed which in common parlance is called answer to a show-cause notice).

82. In effect, the opportunity available to an accused employee gets crystallised into the following three distinct stages:

- (a) A notice embodying the statement of charges based on a set of allegations is served on the employee and the employee's explanation thereto is obtained.

(b) Depending on whether the employee denies any or all the charges, evidence is recorded including cross-examination by the accused employee. This is followed by his own statement and his defence.

At this stage, the inquiry officer draws up his findings and sends them to the competent authority.

(c) Notice is issued to the accused employee informing him of the proposed punishment which the competent authority may tentatively decide upon. Answer is given by the accused employee to this notice. Not until these three stages have passed can punishment be finally inflicted on the accused employee.

83. Needless to say, this involves a long procedure more particularly when in observance of this procedure the accused gets opportunities of inspecting all relevant documents, of being accompanied by a helper during the recording of evidence and oral hearing and at the stage of show-cause notice of being provided with a complete record of the inquiry proceedings and the inquiry officer's report.

84. Here it would be interesting to compare this with the procedure in a criminal trial in a law court. There the charge-sheet is served on an accused who is called upon to plead guilty or otherwise. In case he denies the charges, evidence is taken. This is followed by statement of the accused under Section 342 of the Criminal Procedure Code and his defence, if any. Thereafter, the presiding officer pronounces his judgement and if the accused is found guilty, also the punishment.

85. A comparison of the two will show that whereas in a court of law, a person accused of an offence gets an opportunity to present his defence only once even while the punishment in such a trial may be imprisonment, in departmental proceedings the government official is given two opportunities. The object of mentioning this is merely to show that departmental proceedings can be tortuous and time-consuming.

86. From the discussion about the evolution of the procedure for departmental action in the preceding paragraphs, two important conclusions emerge—manifestly at cross purposes with each other. Firstly, the procedure is firmly founded on certain basic rights conferred on an employee which have not only become time-honoured but are now enshrined in our Constitution. With Article 311 as it stands, even while there may be some scope to streamline the procedural frills through administrative alacrity, (to which we had referred in para 327 of Part I of our Report) the main fabric of the procedure which is designed to guard the obligations cast by the Article does not lend itself to any perceptible abridgement. Secondly, belated action against the erring employee, long after the event, becomes ineffective. Even in cases where the responsibility of an employee in causing an accident is beyond doubt (where he should normally be placed under suspension) the quasi-judicial complexion of the procedure contributes towards delay in the award of punishment, which in consequence loses its purpose.

87. This then is the dilemma. That there is need to evolve a more effective system of fixing of responsibility and meting out punishment for delinquency is clear. There can be no two opinions about the need for prompt and deterrent action against a person guilty of negligence endangering safety of the travelling public. The present procedure however

drawing strength as it does from Article 311 of the Constitution, is apt to set limitations on efforts to achieve the objective of swift and deterrent punishment for an act of delinquency resulting in a railway accident.

88. We were told by a representative of the Railway Board that efforts had been made at the highest level to explore the possibility of amending the Constitution so as to make it possible to deal with the errant railway staff connected with the movement of trains in an expeditious manner but such a course did not find favour.

89. It was urged before us that the Railways in the country have a place of their own. In times of crisis they assume an importance second to none including the defence services. Even in normal times they are the arteries of the nation growing from strength to strength. Railwaymen today, and more particularly those who are directly connected with the safe running of trains, thus more than ever constitute a class by themselves because of the nature of their work and the serious consequences that follow from any negligence in the discharge of their duties. Anything which may tend to weaken the sense of discipline in the vast body of railwaymen or to bring about conditions whereby negligence in the discharge of their duties may be glossed over needs to be eschewed. It is in this light that the case for exclusion of the vast body of the railwaymen—particularly those connected with the safe running of trains—from the purview of Article 311 of the Constitution is put forward.

90. The other side of the picture, and which indeed has considerable validity, is that even while serious consequences may have flowed from an act of omission or commission of a railwayman, it still remains a case of negligence in the performance of one's duty and that the mere fact that the nature of consequences from two different acts of omission and commission may differ can hardly justify depriving a public servant whose negligence may have resulted in serious consequences, of adequate and reasonable opportunity which Article 311 of our Constitution bestows. After all it is not on purpose that a driver drives against a signal or an assistant station master receives a train on a blocked line. If it could be established that the action of the employee was purposive or deliberate there would be other legal provisions to deal with the employee. But as things are, the act of omission or commission of a public servant which may result in an accident cannot in fairness be treated on a plane different from any other act of omission or commission of a public servant which may not result in similar consequences.

91. We would, in consideration of these various factors and of the fact that what is provided for in Article 311 of the Constitution is a time-honoured protection, abstain from recommending that Article 311 of the Constitution be amended.

92. Yet, we do not see why any penalties which are not referred to in Article 311 of the Constitution should be treated as major penalties for which an equally laborious procedure is prescribed. We find from the Discipline and Appeal Rules as applicable to railway staff that at least two other penalties, namely (i) reduction to a lower stage in the time scale of pay for a specified period and (ii) compulsory retirement, are shown as major penalties for which the entire gamut of the complex procedure has to be followed. It has also come to our notice that recently the Railway Board have, apparently at the instance of the Ministry of Home Affairs, prescribed that the penalty of withholding of increment, whenever it is

likely to affect adversely the pensionary benefits or when such penalty is for a period exceeding three years or with cumulative effect should also be treated on the same footing as a major penalty. Whatever might have been the compulsions for doing so, this deviation obviously does not derive strength from the Constitution. Particularly when the Railway Board and the Railway administrations have been laying so much stress on amending the disciplinary procedure and have even gone to the extent of advocating an amendment of the Constitution, we do not see why the penalties not provided for in Article 311 of the Constitution should be so-treated in the Railway Servants Discipline and Appeal Rules. We would urge the Railway Board to take immediate action so that for the imposition of penalties other than those provided for in the Constitution, a summary and simplified procedure is adopted.

93. For the rest, we would reiterate that wherever there is scope for eliminating delays in the processing of cases of disciplinary action in departmental offices, such delays should be eliminated and the procedure for watching the progress of such cases in departmental offices streamlined.

94. *Special Inquiry Officers*—An important reason for delays in finalisation of departmental proceedings which came to our notice is that the executive officers who are otherwise preoccupied with their work are burdened with the task of holding disciplinary inquiries. At times, even a committee consisting of more than one officer is appointed to hold such an inquiry. The fact that the officer or officers are not relieved of their normal duties while conducting the inquiry and where the number of officers is more than one, they have to find dates mutually convenient often results in delays. Furthermore, not all the officers are conversant with the complexity of disciplinary procedure.

95. Taking into account all these difficulties, it occurs to us that the disciplinary inquiry could, with advantage, be conducted by officers trained and deputed exclusively for this purpose. These officers should form a part of the Personnel Branch and should be chosen with due care so that they have a good knowledge of the Discipline and Appeal Rules and where possible also some knowledge of law as well as legal procedures. Not encumbered with other routine duties these officers would be in a position to give their undivided attention to the work of conducting the inquiries. The Personnel Branch of each division can, wherever required, be suitably strengthened for this purpose. We had discussed this proposal informally with some General Managers and the Railway Board and we found the proposal generally acceptable.

Status and grades of supervisors

96. *Loss of self-confidence among supervisors*—During our tours of the various Railways and discussions with the Heads of the administrations and other senior officers it was repeatedly pointed out to us that while supervisors have a vital role to play in the efficient and smooth functioning of the Railways, their status, prestige and authority have suffered greatly in recent years; they have generally become ineffective and a feeling of helplessness and frustration has overcome most of them. They feel that they are not able to take work from the staff or to enforce discipline. Cases of manhandling, assaults or intimidation of supervisors at the hands of the employees themselves or their agents were related to us and the evidence pointed to the fact that the administration had not been able to provide adequate security or legal assistance.

97. A retired Chairman of the Railway Board, in his evidence before us, pointed out that among the most unfortunate things which have happened in recent years one is that the quality of supervisors has greatly deteriorated and that today the weakest link in the administrative chain is the senior supervisor. A retired Member of the Railway Board stated that the supervisory staff have lost heart and that they find it extremely difficult to pull up the staff.

98. The Railways, in their reply to the questionnaire, stated almost unanimously that the authority of senior supervisors has greatly weakened. Some stated that they do not possess adequate powers for taking disciplinary action against the staff. Others held the view that they are reluctant to exercise whatever disciplinary powers are already delegated to them. Some Railways pointed out that supervisors have a feeling that they would not get adequate support from those above them in case complaints arise against them because of their anxiety to get work done. One Railway stated that the supervisors' inability to enforce discipline is primarily because of the spirit of indiscipline fostered among the workers by the unions. By and large, according to this Railway, supervisors are still a disciplined force on the Railways and that it is not too late to rebuild their authority and rehabilitate their position.

99. Among the suggestions given by the Railways to restore their authority, one Railway stated that supervisors should have a say in the promotion of staff working under them and that such a course would induce the workers to be loyal to their superiors. Another Railway suggested that senior supervisors should be authorised to write the confidential reports of the staff under them. Another suggestion was that a system of "rating" for the good work done by the staff should be introduced wherein the supervisors allot marks for work and discipline every month on the same pattern as on the French Railways. A representative of the Railway Board was of the view that powers to inflict certain punishments like reduction by one stage, stoppage of increments, etc. on errant Class III staff may be delegated to senior supervisors. He, however, added that the real thing is that they should be encouraged to use such powers where required. A retired Member of the Railway Board suggested that if a supervisor gives an order such order should ordinarily be supported by his superiors.

100. Practically all the Railways drew pointed attention to the fact that senior supervisors today have inadequate scales of pay and poor prospects of promotion, and advocated a revision of their pay scales and a review of the channels of promotion. They said that the present scales of pay of supervisors are not commensurate with their workload and responsibilities and that for want of adequate channels of promotion there is great stagnation. One Railway pointed out that there is disinclination at times on the part of certain categories of staff to accept promotion as inspectors because often it results in loss of emoluments, as for instance in the case of a driver being promoted as inspector. All these factors therefore combine to take away the motivation for efficient and conscientious supervision. The Federation of Class I Officers' Associations endorsed these views and strongly advocated steps to raise the emoluments of supervisory categories.

101. Our attention was also drawn to the fact that in a number of instances workmen get higher emoluments than their supervisors, more particularly, as a result of the incentive scheme in the workshops. This, it was pointed out, on the one hand encourages indiscipline on the part of staff and on the other makes it difficult to draw suitable men to fill up the supervisory posts.

102. Yet another point which came to our notice was that at present there are a large number of grades of supervisors. Most of these grades are overlapping inasmuch as the top of one grade is well above the bottom of the next higher grade. The net result of this is that even where a supervisor in a certain grade gets promotion he hardly ever gets any substantial increase in emoluments. Usually all that happens is that he is fixed at the appropriate stage in the next higher grade and the net increase in emoluments is but a small amount.

103. The enquiries which we made in regard to the existing scales of pay of supervisory categories revealed considerable multiplicity of grades. It was pointed out to us that in course of time, the number of grades has gone up. Moreover, whereas previously all or most of the grades of inspectors were selection grades with a real emphasis on selection, in course of time, in a number of these grades, seniority-cum-suitability has been injected as the basis. In general, alternate grades have selection or seniority-cum-suitability as their basis.

104. On this aspect a retired Member of the Board pointed out that over the last 20 to 25 years more and more supervisory grades have become seniority-cum-suitability grades instead of selection grades. The trade unions also usually throw their weight in favour of the seniority-cum-suitability basis. In consequence even where the fitness of a person is marginal, there are reasonable chances of promotion. This has had the result of making it increasingly difficult for outstanding persons to supersede others and come up and occupy higher positions out of turn.

105. We are entirely in agreement with the Railway administrations that to strengthen the measure and quality of supervision over the working of staff, it is essential that the position and authority of senior supervisors should be restored. Earlier in this chapter we have already recommended that senior supervisors should be recognised as junior members of management and that their organisation in separate associations should be fostered. We would offer the following further suggestions for consideration:—

- (i) It is desirable that senior supervisors are always consulted in regard to the promotions and transfers of staff in their charge. This will not only be a step in the right direction inasmuch as the supervisors who know the men in their charge and their capabilities most closely would be in a position to help the administration to match the men with their jobs but will also lead a great deal to the strengthening of discipline and respect for supervisors among the staff.
- (ii) The number of grades of senior supervisors should be reduced. As far as possible, most of the grades of senior supervisors should be selection grades. They should be so devised that the top of one grade is well below the starting point of the next grade so that when a person is promoted to the next grade he gets a substantial rise in emoluments. The present grades were last considered by the Second Pay Commission a decade ago. It is not for this Committee to go into the details of the grades or to suggest a wholesale review since rightly, this should be dealt with by a future Pay Commission, but as an interim measure we would like to suggest that the topmost grade of senior supervisors should be appropriately raised keeping in view present day conditions as also the scales of senior supervisors in comparable posts elsewhere.

- (iii) To improve the status of senior supervisors, to impart them greater self-confidence and to broaden their channels of promotion, we consider that wherever there is a large concentration of staff working under a senior supervisor, the post should be upgraded to gazetted status, Class II. Here, we might point out that the General Manager of one Railway had put forth this point very forcefully and stated that he had examined this question in detail. According to him, the expenditure involved in the implementation of such a scheme would be marginal and the enlargement of the Class II cadre would not create any difficulties in the form of blockage in promotion to Class I Service as most of the senior supervisors who would rise to Class II posts on this basis would retire during the period of Class II Service. And yet this would greatly build up their status and self-confidence and would enable them to exercise their disciplinary powers in a more effective manner. We would leave it to the Railway Board to work out the implications of this scheme in consultation with the Railway administrations. As a broad guideline, we suggest that wherever there is a concentration of say 300 to 500 men, the status of supervisors should be raised to Class II. In suggesting this, we wish to emphasise that it would be unfortunate if by implementing such a recommendation, all that happens is that good supervisors are replaced by indifferent officers. We would, therefore, stress that special care is taken in selecting the right type of men whenever it is decided to upgrade the posts of senior supervisors to Class II category. It would also, in our view, be inadvisable to change the designation of say a Foreman to an Assistant Mechanical Engineer or of a Yard Master to Assistant Operating Superintendent when upgrading some of the posts as such a step is from a psychological point of view likely to give an impression to the incumbent as if the nature of his job and responsibilities is altered. It would in our view be advisable to retain the present designations. If at all any modification is called for, we recommend that for the sake of uniformity the upgraded posts may be designated as Yard Superintendent, Shop Superintendent, Loco Superintendent, Station Superintendent etc.
- (iv) The only way we can think of whereby senior supervisors can be encouraged to exercise the disciplinary powers delegated to them more effectively wherever called for is to support the action of senior supervisors unless there are good and sufficient reasons to the contrary. The most constructive step in fortifying the self-confidence of senior supervisors and discipline among staff would, in our view, be to create conditions whereby it becomes known right down the line that the action taken by the supervisors on the spot will ordinarily receive the support of the administration.

Reservation of posts for scheduled castes and scheduled tribes

106. In the course of evidence tendered before us, it was pointed out that among the factors responsible for the discontent among supervisors, one was the present procedure of reservation of posts for scheduled castes and scheduled tribes. Such reservation, we were told, adversely affects the enthusiasm, incentive for hard work and devotion to duty and in turn the efficiency and morale of supervisory staff.

107. We find that the principle of reservation of posts for scheduled castes and scheduled tribes operates not only at the stage of initial recruitment but also in respect of vacancies which are filled by promotion, as a result of a positive act of selection. The orders of the Ministry of Home Affairs extending the principle of reservation of vacancies for scheduled castes and scheduled tribes to all grades which are filled by promotion through competitive examination limited to departmental candidates were made applicable on the Railways in 1959. More recently, on receipt of recommendations of the Yardi Committee, the Government reviewed the position and it was decided to provide reservation quotas for scheduled castes and scheduled tribes in promotion to all selection posts in which the element of direct recruitment does not exceed 50 per cent. It was also decided to extend the reservation to promotions from Class III to Class II filled on the basis of examination limited to departmental candidates, the percentage of reservation being 12½ for scheduled castes and 5 for scheduled tribes, that is, the same percentage as applies for reservation at the level of initial recruitment.

108. In the implementation of the decision to fill the reserved vacancies at the promotion level, weightage in favour of candidates belonging to scheduled castes and scheduled tribes is given in various ways. For instance, in promotion by selection from Class III to Class II, a scheduled caste or scheduled tribe employee rated as 'good' by the Selection Committee is equated to the employees rated "very good"; and if such a candidate is rated 'very good' by the Selection Committee, he is equated to others who are rated as "outstanding". Similarly, in respect of promotions to selection posts in Class III, whereas for all other candidates the qualifying marks under "professional ability" are 30 out of 50, for scheduled castes and scheduled tribes, the qualifying marks are 25 out of 50. In other words, in order to improve the representation of scheduled castes and tribes in posts filled by selection, the qualifying standards are lowered.

109. We have given thought to the question of reservation of posts and the weightage for scheduled castes and scheduled tribes in the promotion vacancies. It is true that Article 16(iv) of the Constitution permits such reservations with a view to giving adequate representation to the relatively backward communities in the society. We are also aware that the principle of reservation of promotion vacancies was upheld by the Supreme Court. The provision in the Constitution and the pronouncement of the Supreme Court show the concern and sympathy for scheduled castes and scheduled tribes. These, however, have necessarily to be counter-balanced with the need for maintaining the efficiency of the administration at a reasonable level. It must be appreciated that reservations for a community or a group of people must not be at the cost of overall efficiency of the administration.

110. We were advised by the Railway Board that the Railways have been issued instructions not to relax standards in favour of scheduled castes and scheduled tribes where safety is involved. We welcome this assurance but we feel that in actual practice, it may be impracticable to abide by these instructions since the extent to which the various posts have a bearing on safety in train operation may not be uniformly apparent. At the stage of initial recruitment there is, of course, no objection to reservation of quotas for scheduled castes and scheduled tribes. At the promotion stage, however, the reservation of quotas for, and the weightage given to, candidates belonging to scheduled castes and scheduled tribes can give

rise to a feeling of inequity among the staff who have already put in several years of service. Such quotas at the promotion stage have already been in operation for the last ten years. We consider that the Government should review the question now in the context of the present day conditions and in the light of the evidence referred to in the foregoing paragraphs.

The calibre and position of railway officers

111. We have already referred to a widespread sense of dissatisfaction among the category of officers which, we found, has been growing due to a variety of factors. Our visits to the Railways and our talks with various officers confirmed our impression of the general feeling of discontent among all categories of officers. Some vital factors like outside interference and the role of Vigilance in engendering dissatisfaction among officers have already been mentioned by us in the earlier part of this chapter. Coming now to their pay scales and promotion prospects, it was pointed out to us that while the work and responsibilities of railway officers have, in the present democratic set-up, grown beyond all proportion and the importance of the role which they have to play is generally recognised, their unfavourable pay scales in comparison with those of their counterparts in the public sector and other comparable services elsewhere, inadequate opportunities for deputation assignments, slow promotion prospects arising mainly out of injudiciously large-scale recruitments in various years and an unbalanced cadre structure have all resulted in general discontent among railway officers.

112. The Federation of Class I Railway Officers' Associations, in their evidence, furnished to us a comparative study of the advancement prospects of officers in various services as reflected in the cadre structures of the services in which recruitment is made through a common competitive examination of the Union Public Service Commission. We reproduce this below.

Services	Years of service for entering		
	Jr. Adminis- trative grade	Sr. Adminis- trative grade	
1 Indian Postal Service	8 years	26 years
2 Indian Defence Accounts Service	11 years	20 years
3 Indian Audit & Accounts Service	11 years	15 years
4 Indian Revenue Service	14 years	21 years
5 Indian Railway Services	18 to 20 years	25 years

Note : Based on classified list of officers 1966.

113. The Federation of Class I Officers' Associations, in drawing our attention to the above statement, pointed out that in most of the Services, the promotion to the Junior Administrative Grade (Rs. 1300—1600) takes about 8 to 11 years' time whereas in the major Railway Services it takes 18 to 20 years. Similarly, while it takes 15 to 20 years in some of the Services for an officer to reach the Senior Administrative Grade, it hardly ever takes less than 25 years for an officer in the major Railway Services to reach that stage. Furthermore, there is discrimination between the Senior Administrative Grades on the Railways on the one hand and other departments on the other.

114. The Federation also drew our attention to the fact that the position is worsened because other Services like the Indian Audit and Accounts Service and the Defence Accounts Service have a much larger percentage of officers on deputation in Administrative Grades outside their respective departments than the Railway Services. The Federation furnished the position as obtaining in 1966 when the Indian Audit and Accounts Service with a cadre of 519 officers and the Defence Accounts Service with a cadre of 165 officers had 128 and 29 of their officers (24.6 per cent and 17.5 per cent) respectively on deputation in Administrative Grades. As against this, the Railway Services with a cadre of 4200 officers had in the same year only 50, i.e. 1.2 per cent. on deputation in such posts outside the Railway Ministry. Even if deputation to the Railway Board and the R.D.S.O. is taken into account, the percentage, we were told, worked out to only 3.6.

115. Our attention was also drawn to the fact that on the Railways, the percentage of officers in the Junior Administrative Grade and above in relation to the total number of officers compares unfavourably with the corresponding percentage in other departments of the Government. The Federation quoted the relevant figures for the year 1966 in this behalf which we reproduce below:—

Railways	...	...	...	15.0
Indian Audit & Accounts Service	...	...	...	31.0
Indian Defence Accounts Service	...	...	...	33.0
Indian Income Tax Service	...	...	...	28.0
Indian Postal Service	...	...	...	22.0

116. We understand the position in Railway services has changed slightly since then with the upgradation of certain posts. Even so, as compared to the other Services, the Railways continue to compare unfavourably.

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117. We were also told that the emoluments drawn by officers in the major departments on the Railways when compared with those drawn by officers in other government departments with corresponding lengths of service show a large disparity. This disparity is even wider when the emoluments of officers on the Railways which are the biggest national commercial undertaking are compared with those of the executives of public sector undertakings with comparable status and responsibilities. As an instance, it was pointed out that a Divisional Superintendent on the Railways who is the head of a division and whose responsibilities may be aptly compared with those of the heads of several of the public undertakings in terms of the number of staff employed, the operating results and the capital-at-charge on a typical railway division vis-a-vis such undertakings enjoys a highly unfavourable position.

118. We have no doubt in our minds that if a vast organisation like the Railways is to function efficiently, it must have in its superior cadres men of the best calibre available. Obviously, the objective is unlikely to be achieved unless service conditions are such as to attract talented young persons. Recruitment to Class I cadres of the Railways is made by the Union Public Service Commission through a combined services examination by which recruitment to a number of other services is made. Unlike in the past, the bulk of the top class students in the Universities today

prefer to go to private industries and public sector undertakings on grounds of better pay and prospects and many of them do not care to appear in the UPSC examinations. Among those who do take the UPSC examinations, it was pointed out to us, the Indian Railway Traffic Service receives a much lower preference today as compared to the other Central services like the Audit and Accounts and Income-Tax Services, and as a result those who eventually are drawn to the Railway Services are not among the topmost of even those who take the competitive examination. This obviously is a cause for considerable concern since the cadre of railway officers which hitherto has acknowledgedly been composed generally of talented and capable officers faces a serious risk of being diluted in the future. It is of vital importance that steps be taken to attract suitable men to man these services since it is on the capability and initiative of young officers that in the years to come, the operational efficiency of the railways must depend.

119. We realise that it is not our function to spell out details of the proposals for improving the pay scales and prospects of officers, but we are anxious that the general feeling of discontent should be cleared up and the cadre structure of railway officers should be so recast that from the point of view of prospects, the best talent is attracted to the Railway Services. We also understand that the Administrative Reforms Commission went into this matter in considerable detail recently and have made certain recommendations. We have no doubt that the Government will consider these recommendations closely, appreciating the need for urgent action. We would, on our part, urge them to devote their attention to this problem without loss of time.

120. *Officer-staff and supervisor-staff ratio*—In our discussions with the Railway administrations on the importance of effective contact and two-way communication between the management and the staff and the need for personal contact between officers and the men working under them, most of the Railways stated that while they fully realised the need for such contact and communication, the existing officer-staff and supervisor-staff ratios are too low to ensure this personal contact and continuous two-way communication between the management and the men.

121. As for the reasons for the low ratio it was, among other things, stated that with the expansion of the railways during the last two decades, the units of administration have become much larger and generally unwieldy but there has not been a corresponding increase in the strength of supervisors and officers. The result has been that personal contact between officers and supervisors on the one hand and the staff on the other has been steadily shrinking.

122. It was stated that while the ratio of officers to staff in most of the departments is low, such ratio is the worst particularly in the Transportation and the Mechanical Engineering departments. The total strength of officers on the Railways is a little over 7,100 and the ratio thus, in relation to 1.35 million men, works out to about 1:190. As against this, the ratio in the Transportation department is 1:452 and in the Mechanical Engineering department 1:712.

123. We had asked the opinion of the various Railways as to the optimum officer-staff and supervisor-staff ratio. From the replies given by the Railways, we find that there is considerable divergence of opinion. While some Railways consider that the ratio of 1:500 as between officers

and staff would be adequate, others consider that the ratio should not be less than 1:100. We do not consider ourselves competent to make a definite pronouncement on the ratio. It is obvious that the optimum ratio would not only differ from department to department but even within the same department it might differ considering the geographical distribution of staff and jurisdiction of officers. For instance, where the staff are scattered and far flung over a large area, to maintain adequate contact with the staff, the administration may need a larger number of officers. On the other hand, where there are concentrations in a limited campus, perhaps a smaller ratio might be found adequate. Having found that there is general awareness in the Railways of the problem and of the inadequacy of the present ratio, we would like to leave it to the Railway Board and the Railway administrations to work out after proper scientific study, the appropriate ratios between officers and the staff. We need hardly point out that to improve the ratio, the matter would have to be tackled from both ends, that is, to strengthen the number of officers and supervisors wherever required on the one hand and to make suitable adjustment in the number of men in the various wings.

124. We would like to make a mention of an associated matter which though not strictly related to the ratio between officers and staff has relevance to the organisational structure of the management, insofar as it affects two-way communication between the top and the middle management. The present set-up on the Railways has no doubt stood the test of time but in the present situation with the increasing tempo of traffic, increase in manpower and the complexity of management problems, a time has come when serious thought should be given to streamline the command structure on the Railways to deal with the challenges of the present and the future. One way in which this may be accomplished is for the organisational structure to be subjected to an expert study.

The burden of paperwork

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125. While discussing the problem of effective supervision by officers and supervisors over their respective jurisdictions we were told that officers and supervisors find little time to attend to their field duties since they are overburdened with paperwork and are compelled to devote a considerable amount of time in their offices attending to files and correspondence. The general lack of trust in the men on the spot, absence of adequate and dependable tele-communication facilities, outside interference and a tendency to introduce a more elaborate procedure whenever something goes wrong somewhere were adduced as the reasons for the increase in unproductive paperwork.

126. We are aware that this state of affairs is not peculiar to the Railways and has become a feature of work in most Government offices due to the reasons referred to above and is hardly likely to lend itself to an easy solution.

127. *Utility of consultancy*—A General Manager of a Railway, during his evidence, stated that it would be desirable to have a person from outside—not necessarily a foreigner—to have a good look at the procedures. We endorse this suggestion and recommend that paperwork as far as it is generated by infructuous procedures may be the subject matter of a fruitful study by a team of management consultants. We would like to add here that the impression we gathered was that the railway administrations like

other government departments fight shy of the idea of engaging consultants as if such a course would reflect on their competence. We consider that consultancy in the matter of office procedures as also in other fields may open up the management to fresh and useful ideas. Considerations of false prestige should not be allowed to come in the way in such matters.

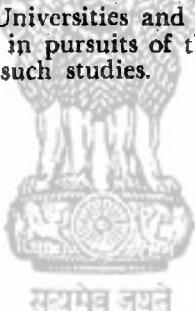
128. *Devolution of authority and delegation of powers*—We would also suggest that the Railway Board and the Railway administrations should investigate whether any further devolution of authority and delegation of powers would not be conducive to a reduction in the volume of correspondence and paperwork. In saying this, we would, of course, like to strike a note of caution that any delegation of powers can have utility only if the authority to whom the power is delegated is allowed to exercise the power and obviously it will be rendered ineffective if distrust in the man on the spot continues to prevail.

Railway Labour Science Research Institute

129. The mental make-up of an individual engaged in duties which call for a high degree of alertness amidst the financial and other worries and the stresses and strains of the complex present day life presents a highly intricate socio-psychological problem. To add to the complexity come in other factors like the functioning of an individual's faculties during periods of inaction punctuated by sudden spurts of concentrated activity, working in conditions of total solitude and inclement weather at times, working continuously during night time and during odd hours for prolonged periods extending over several days and sometimes months at a stretch, the drowse-inducing drone of the diesel locomotive and so on. All these situations call for a close and continuous study of human behaviour under varying conditions. It is against this background that, we understand, the Japanese National Railways had set up their Railway Labour Science Research Institute. According to the information available to us, the Japanese National Railways have been devoting a good deal of attention to this problem, namely, of correlation between man and machinery which has come to the fore with the introduction of modern-day techniques. The effective use of modernised techniques and machines, it is realised, is possible only through maintenance of harmonious relationship between the characteristics of human beings and those of machines. Any let-up in these harmonious relations insofar as railway operation is concerned can result, and sometimes does, in disastrous accidents. It was evidently in this realisation and with the object of making a study of human engineering insofar as it affects railway working that the Japanese Institute was started about six years ago.

130. Apart from various studies on aspects which arise in day-to-day train operation, the Japanese Railway Labour Science Research Institute has occupied itself with fundamental research on perception, sensation and mobility of its workers, investigations in the content of aptitude tests and the development and introduction of new testing methods and socio-psychological researches aimed at developing keenness in work and spirit of cooperation. The Human Engineering Research Laboratory attached to the Institute, in addition, conducts research on the techniques of accident prevention and safety and on the psychological make-up which leads up to mistakes and forgetfulness. The application of the results obtained from such fundamental physiological and psychological research are utilised for evolving rational working methods.

131. We consider that in a vast organisation like the Railways which employs more than a million workers, such labour science research would not be a mere refinement or a needless sophistry but an organ of considerable practical utility. We had referred to the Psycho-Technical Cell in the Railway Board in Part I of our Report. This Cell, we are told, is at present engaged in research on aptitude tests to determine the suitability of a man for a job. We find that even with the highly limited objectives which the Cell has set for itself, the progress which it has made so far has been insignificant. We acknowledge that in matters of this nature, it is better to proceed slowly rather than jump from one thing to another in a haphazard manner. Nonetheless, we consider that the scope of such studies should be suitably enlarged so that it is not confined merely to building up of some aptitude tests but encompasses the broader problems of the socio-psychological make-up of the railway worker and of human engineering which have particular reference to rational and safe working on the railways. We would commend for the consideration of the Railway Board that they ascertain from the Institute on the Japanese National Railways and from similar institutes which the railway systems of other advanced countries may have established in the fields of investigation which they undertake and the techniques adopted and thereafter draw up an integrated programme of socio-psychological study and research. It occurs to us that Universities and other institutes and foundations in the country engaged in pursuits of this nature may be in a position to aid the Railways in such studies.



CHAPTER III

TRAINING OF STAFF

Training Schools—Capacities and facilities

132. We had, in Part I of our Report, observed that the available capacity in the training schools on the zonal Railways was being utilised only partially and had urged the Railway administrations to locate and remedy the factors which militate against the proper utilisation of the existing training facilities.

133. During the course of our tours, we had occasion to visit several of the Zonal Training Schools and the System Technical Schools which between themselves impart training to various categories of staff like guards, drivers, station staff, train examiners and other artisan staff. The Principals of most of these training institutions agreed that they were in a position to take on a heavier load of work and that the available capacity was not being fully utilised. A few isolated instances of shortcomings in the facilities for training were brought to our notice during our visits to these schools. For instance, at the Zonal Training Schools at Alipurduar and Tiruchirapalli, it was pointed out that the hostel accommodation was inadequate. On the Northern Railway, facilities for training of carriage and wagon fitters were reported to be deficient. Some training schools complained that they were not receiving the accident inquiry reports of the Additional Commissioners of Railway Safety and to that extent the instruction imparted by them on safety aspects was deficient. Apart from these few deficiencies in the facilities for training, we found the arrangements for general-purpose training of staff generally adequate.

134. We also visited the Indian Railway School of Electrical and Mechanical Engineering, Jamalpur, the Railway Staff College, Baroda and the Indian Railway School of Signal and Telecommunication Engineering Secunderabad. At Jamalpur, we were told that there was ample scope for intensifying the training of drivers, train examiners, trade apprentices etc. The capacity of the Railway Staff College, Baroda, we were advised, was not only being fully utilised, but had become a limiting factor and was proposed to be augmented. At the Secunderabad School, we were advised that in addition to officers, the Signal Inspectors also received training in the maintenance of sophisticated signalling equipment.

135. On the South Central Railway, however, we were struck by the absence of a Zonal Training School. This Railway came into existence about three years ago, but until now the training of staff of this Railway is being catered for by the Zonal Training Schools of the Central and the Southern Railways. We consider it essential that the setting up of a Zonal Training School and the creation of training facilities on the South Central Railway are not delayed further.

Training of staff in the maintenance and operation of modern sophisticated equipment

136. The observations which we have made in the foregoing paragraphs relate mainly to the general-purpose training imparted to staff and officers. The problem which the Railways face today and which they are

likely to face in an increasing measure in the years to come pertains to specialised training in the various fields of railway working which are undergoing modernisation. With the introduction of modern highly sophisticated equipment in various fields of railway operation, it has become imperative that the staff entrusted with the responsibility of handling, operation and maintenance of the equipment are imparted adequate and intensive training. On our tours, however, we received a large number of complaints from the staff and at times from officers in regard to inadequate and patchy training of such staff. We attach great importance to this problem and propose to discuss this in the following paragraphs.

137. *Training of signalling staff*—Modern signalling is a highly technical science and in consequence requires highly intelligent, technically qualified and thoroughly trained staff for handling and operation of the equipment. The firms who are given the contract to instal these undertake to maintain the new installations on a Railway for a limited period. During the course of installation, a small number of staff is associated with the manufacturers. They become acquainted with the equipment and are in due course expected to maintain the installations in the construction of which they were associated. We have been given to understand that this practice is at present in vogue on the Railways without exception for the training of electrical signal maintainers and inspectors who are subsequently entrusted with the maintenance of highly complicated installations like route relay interlocking, centralised traffic control etc. The shortcoming of this arrangement is that the training is not systematised and the staff are left to their own resources to pick up whatever they can.

138. During the course of evidence of a number of mechanical and electrical signal maintainers; we could not help forming the impression that most of them were either mediocre in calibre or quite incompetent in their jobs. Quite a number of those who appeared before us said that they had hardly any opportunity to be trained in their jobs in a systematic manner and hence were not fully conversant with the working of the complicated signalling plants in their charge. Most of them lacked technical qualifications and had been picked up from among those who had earlier worked only on the conventional mechanical signalling.

139. The Railways, in their replies to our questionnaire, offered diverse views on the subject of training of staff in the maintenance of modern signalling equipment. Some of them said that no difficulty was being experienced; others thought otherwise. It was made out by some of the officers during their evidence that the responsibility for the maintenance of installations like route relay interlocking and other sophisticated signalling equipment lies on the inspectors and not on the maintainers and that the inspectors get adequate training in the School at Secunderabad. This we are not inclined to accept as not unoften maintainers have to attend to their jobs unaccompanied. The opposite version was given by a Chief Signal and Telecommunication Engineer of a Railway who stated during his evidence before us that he was generally dissatisfied with the training of not only the signalling staff but also of the operating staff in regard to the maintenance and operation of sophisticated grades like route relay interlocking, centralised traffic control etc. He added that the staff did not fully understand the use of modern equipment and as a result the incidence of failures was higher than what it should be. Even though endeavours were made to train the staff prior to the commissioning of the modern signalling installations, difficulty arose as each department

trained its own staff and the number of officers who could impart the training was inadequate. The period of training was also short. Another Chief Signal and Telecommunication Engineer said that maintainers picked up work by practical experience. Their performance, he said, was watched before they were put on the job, but no regular test was taken. In a hand-out given to us on a Railway, it was indicated that there had been an increase in the incidence of derailments on a route relay interlocking installation due to teething troubles and also owing to the staff of the signalling and operating departments not being fully conversant with the maintenance and operation of panel interlocking. A retired Member of the Railway Board observed during his evidence that he had always felt and tried to take measures to see that the maintenance of sophisticated signalling equipment kept pace with the rate of expansion since it would do more harm than good if they were not maintained properly. This, he went on to say, was something which the people had a tendency to forget. We are disposed to agree with this witness entirely. We ourselves found that some of the maintainers and operators who gave evidence before us conveyed a poor impression of their professional competence. An approach to training which aims at leaving the trainee to his own resources is neither systematic nor scientific and we hope that the Railways would shed their complacency regarding the present practice of imparting indifferent training to maintainers.

140. We were told that the Central Railway had recently set up a training centre at Byculla for the training of electrical signal maintainers. We commend the foresight of this Railway and strongly urge the setting up of a well-equipped training centre on each Railway for the training of electrical signal maintainers needed for the maintenance of modern signalling equipment. These centres should be adequately equipped with the working models of modern signalling installations and lessons should be given on basic techniques, installation and maintenance. Curricula should be framed for both initial and refresher training.

141. We were informed by the Director, Signal and Telecommunication Engineering of the Railway Board that in 1957, a Standards Advisory Committee had gone into the question of syllabus, training, qualifications and recruitment of signal maintainers and inspectors. The recommendations of this Committee were accepted and were implemented from 1962 onwards. He added that it was proposed to discuss this matter in the next conference of the Chief Signal and Telecommunication Engineers due to be held in the Railway Board's office in May, 1969, so that a Committee of officers could be deputed to examine this question in further detail. It was stated that this Committee would go into the question of minimum qualifications, period of training and grades so as to attract suitable men. We understand that the said Committee has not yet given its recommendations. We consider that the question of recruitment, training and grades of signalling staff calls for an urgent decision and would be in the interest of safety in operation which modern signalling equipment aims at providing.

142. We further suggest that the panel operators to be employed for operating route relay installations, centralised traffic control etc. should also be trained in the centres set up for training of signal engineering staff, so that before they are put on the jobs, they get an opportunity of learning their jobs on working models. We also feel that competency certificates should be issued to operating staff by authorised officers of operating

and signalling departments jointly after a proper test before they are employed on the operation of modern signalling equipment.

143. Our attention was drawn to the fact that electrical and mechanical maintainers and inspectors are almost always separate hands and function separately. According to this system, each maintainer or inspector has to cover a large number of stations and a good deal of duplication results in the maintenance and inspection of gear apart from some diffusion in responsibility. With a view to making the inspections more intensive and reducing wastage of time and energy inherent in the present system, it is suggested that mechanical and electrical cadres should be combined and integrated into a single cadre. This step would, in our view, result in closer inspection and better maintenance of signalling equipment.

144. *Staff for maintenance of electric locomotives, traction and other electrical equipment*—The burden of evidence in respect of the technical proficiency of staff entrusted with the maintenance of electric locomotives, traction and other electrical equipment more or less echoed what had been stated before us in respect of electrical signal maintainers. We were told that whereas the maintenance of electric locomotives and other traction equipment is a highly technical and specialised job requiring repairs, inspection, precision testing and measurement of a wide variety of machines and equipment and it is essential that the staff with the requisite qualifications and experience should be specially selected and trained to suit these jobs, at present the staff lack the technical knowledge of the latest sophisticated electrical equipment and each Railway follows its own system of imparting training to the staff for this purpose.

145. We understand that the Railway Board have laid down the curriculum of training required to be imparted to supervisory staff deputed for the maintenance of electric locomotives and electric traction equipment on the lines indicated by the manufacturers. However, some of the Chief Electrical Engineers suggested during the course of their evidence that a centralised training school on the lines of the Signal and Telecommunication School at Secunderabad should be set up to train the supervisory staff of all Railways in inspection and maintenance of electric rolling stock and traction equipment. In addition, each Railway having electric traction should have a school for training of artisan staff and for giving them refresher training. This school should also cater for the training of staff employed for the maintenance of general electric and train lighting services. We consider that the implementation of these suggestions would be a step in the right direction.

146. *Staff for maintenance of diesel engines*—As in the case of signalling staff, we observed lack of uniformity in the training of staff for the maintenance of diesel locomotives. On one Railway, facilities have been provided in the diesel shed where the staff entrusted with the maintenance of diesel locomotives undergo initial, promotion, and refresher courses. On another Railway, sandwich courses of training are organised partly in the class room and partly in diesel sheds for training of staff for the maintenance of diesel locomotives. The training school on this Railway is yet in the process of being set up for training of staff required to maintain diesel locomotives. We suggest that the Railways should create adequate facilities in their System Technical Schools or alternatively in schools attached to the diesel sheds for imparting proper training to the staff employed on the maintenance of diesel locomotives.

147. Training of diesel and electric locomotive drivers—Any Railway switching from steam to diesel or electric traction faces the transitional problems of training of staff for maintenance and repair work as well as for operation of diesel and electric locomotives. Drivers to man diesel and electric locomotives are drawn mainly from steam traction. Though several Railways have introduced the pattern of training of diesel and electric drivers through training in simulation cabs, we feel that a greater degree of uniformity in this important 'conversion training' is necessary. Detailed curricula of training under Indian conditions should, in our view, be drawn up in the near future after a careful study.

148. Some of the Railways have set up training facilities at one or the other of their schools. On others, the diesel and electric locomotive running staff are trained in loco sheds. These Railways consider that the 'conversion training' of 14 weeks to 6 months given to steam engine drivers would be adequate to accomplish the changeover.

149. During our discussions with Col. D. McMullen, till recently Chief Inspecting Officer, British Railways he emphasised the great need for imparting intensive training to drivers when they were switched over from steam to diesel or electric traction. Col. McMullen suggested that techniques adopted for training the drivers for diesel and electric locomotives should be on lines similar to those employed for training of aircraft pilots. It should be a simulation training organised with great care if a crash programme of converting steam locomotive drivers into diesel or electric locomotive drivers is to be gone through.

150. We agree with the appraisal of the problem by Col. D. McMullen. It would be well to realise from the outset that a diesel or electric locomotive is not a rugged machine like a steam locomotive. The controls on the former are finer and more sensitive. The diesel and electric locomotives are not only much costlier but if handled properly, far more efficient and contrarywise if handled incompetently are more apt to failure. It naturally follows that the driving staff for diesel and electric locomotives should have adequate educational and technical background. We understand that a process of selection is already in force but we would emphasise that where they have to be selected from amongst steam locomotive drivers, they must be screened carefully and considerations of seniority etc. should not be allowed to come in the way of proper selection of men. It should also be borne in mind that as a rule, a man's capacity for learning a new job gets considerably reduced after attaining a certain age. Having selected the staff for working diesel and electric locomotives, these men should be put through a systematic course of training under the guidance of fully trained and thoroughly experienced personnel. The 'conversion training' given to steam locomotive drivers would, unless it is on a systematic and properly directed basis, be hardly adequate to accomplish an efficient changeover.

151. We would like the Railways to keep a special watch on the nature of lapses on the part of the diesel and electric locomotive drivers which result in accidents as these may be useful pointers to the shortcomings in their training. It is also our view that the aptitude tests which have been evolved or are in the process of being evolved by the Psycho-Technical Cell should, in the first instance, be applied to the categories of electrical and diesel locomotive drivers before selection and recruitment.

152. *Staff for mechanised inspection and maintenance of track*—We need hardly stress that the success of mechanised inspection and maintenance of track would depend on the availability of suitable personnel for maintaining and handling the equipment no less than on the equipment itself. This makes it necessary to give specialised training to inspectors and the skilled categories of operators and maintenance fitters.

153. In reply to our questionnaire to the Railways, one Railway suggested that centres should be set up at selected places for giving intensive training in mechanised maintenance and inspection of track. Some others felt that it would be preferable if the mechanics and fitters are given training in the works of the firms manufacturing the machines. It would, in our view, be advantageous if an integrated programme which provides intensive training to the staff in mechanised maintenance and inspection of track both in the works of the firm manufacturing the machines as also in the field, is evolved.

154. We were advised that the Committee of officers which went into the question of welding of rails recommended that scientific approach should be inculcated in staff at all levels dealing with long-welded rails through initial training and frequent refresher courses. We are in agreement with this approach. This would also hold true in case of staff deputed for maintenance of track by measured shovel packing. We would suggest that necessary facilities are built up on each Railway and as a first step instructors for these jobs are trained by the R.D.S.O. or at a suitable centralised training centre.

155. *Staff to operate ultrasonic testing equipment*—With the progressive introduction of ultrasonic testing on the Railways for assuring safety in train operation, it has become necessary to impart proper training to railway personnel in the field of ultrasonic testing of axles, rails etc. We understand that the Railway Board have asked the Research, Designs and Standards Organisation to arrange for the training of staff in the use of ultrasonic flaw detectors. In reply to our questionnaire, the R.D.S.O. stated that a modest beginning has been made in this direction and a proposal for setting up of a training school for training the staff in the use of ultrasonic testing equipment to cater for the need of the operators and giving them refresher courses is under consideration. We feel that the setting up of such a school for the training of staff in the use of ultrasonic flaw detectors should receive high priority.

156. *Personnel of the stores department*—We have referred elsewhere in this Report to the need for gradual replacement of the outmoded error-prone manual methods of stores handling by more scientific methods of materials management. This raises the question of the role of staff who have ultimately to implement the modern methods of inventory control and materials management. We have been advised that at present the entire stores organisation, barring of course a few officers, is managed by non-technical staff. In their replies to the questionnaire, the Railways, by and large, suggested that technically qualified persons, preferably engineering graduates, should be recruited to the stores cadre. We, on our part, consider it necessary that the Railways embark on a course of training of personnel who have to man the stores organisation.

157. We feel that necessary facilities for imparting such training will have to be created on the Railways or in a centralised institution. It was suggested to us during the course of evidence that the Indian Railway

School of Electrical and Mechanical Engineering, Jamalpur, was in a position to train not only the staff and officers of the electrical and mechanical departments, but also of the stores department. We see merit in this suggestion and suggest that the possibility of making use of this or other similar institutions or for developing alternative facilities for training of stores personnel be examined.

158. Refresher training—We had, in Part I of our Report, stressed that the categories of staff in need of refresher training should be given such training without any exception. A retired Chairman of the Railway Board expressed the view that unless training in service, that is refresher training, continues to be imparted to staff from time to time and at intervals which are not long, the sense of safety-consciousness becomes difficult to maintain in the work-a-day life of the staff. A retired Member of the Railway Board felt that the refresher training was not as intensive as it should be. We consider it essential that training in service should be intensive, regular and should be more job-oriented than theoretical as is the case at present.

159. Training of supervisors—We have in the previous chapter referred to a general dilution in the quality of supervisors due to a variety of reasons. One reason has been the unprecedented expansion of Railways in recent years due to which a large number of posts of officers were filled from amongst the category of supervisors; the filling of the resultant vacancies led to men with inadequate training and experience getting appointed as supervisors and the consequent dilution of the cadre of supervisors.

160. We cannot over-emphasize the need for the proper training of inspectors and other supervisors since ultimately the interpretation of what the administration requires its workers to do rests in the hands of these men who are in direct contact with the workers. On the quality of these men depends not only the image of the administration in the eyes of the worker but also the quality of output which would ultimately emerge. Furthermore the problem has, in recent years, assumed added urgency with the coming into use of modernised equipment and technology in various fields of railway operation. It is therefore of vital importance that specialised courses are arranged for these inspectors and supervisors both to develop their outlook and to make them professionally more competent. Indeed, this is a matter so important in our view that it should receive the attention of, and may be watched by, the General Managers themselves. We have no doubt that those who undergo such specialised courses would emerge as better inspectors and better supervisors.

161. It was pointed out to us that the Railway administrations were seized of the problem and that courses of training for supervisors were being imparted at different training centres. The Kunzru Committee had emphasized the need for developing an all-India outlook among the supervisors. According to the information given by the Railway Board, arrangements were made for conducting a centralised course in supervision and management in the Northern Railway Zonal Training School at Chandauli. A course each was held in 1964 and 1965 and two in 1967. Judging from the fact that in the last four or five years only four courses were

held, it is doubtful if the matter is receiving the attention which it deserves. We are also doubtful if the facilities and the calibre of instructors at Chandausi are such as to make it possible to orient the course with an all-India outlook.

162. It was of course a matter of satisfaction to us to find that the signal engineering supervisors of all Railways are trained at the Signal and Telecommunication School, Secunderabad. But no corresponding facilities appear to exist for the supervisors of civil engineering, transportation and mechanical engineering (except those concerned with fuel economy). This not only results in different standards of training of supervisors on the various Railways but also precludes their being able to acquire an all-India outlook. We would suggest that refresher training of senior supervisors belonging to civil engineering, transportation and mechanical engineering departments should, like those of the signal engineering department be arranged at the respective all-India training centres at Poona, Baroda and Jamalpur. Specialised courses of three or four weeks' duration organised at regular intervals should make it possible for all inspectors and supervisors to be trained and oriented reasonably adequately within a short span of time. If the existing facilities at these institutions are inadequate, it would be as well to augment them suitably.

163. *Training of officers*—A number of useful suggestions were made by senior railway officers—serving or retired—during their evidence before us in regard to the training of officers. Some of these, which in our view merit attention, we indicate below:—

(i) Probationary officers at present receive purely theoretical training at Baroda though they are taken round on the Railways occasionally. The actual work which they have to do on the open line, they learn only if somebody is there to show them how a thing is or can be done. An experienced officer should be specially selected and put incharge of them so that they are not left to their own resources to pick up what they can. There should be wholetime training officers deputed for the purpose.

We understand that a scheme has since been started for probationary transportation officers at Asansol where young trainee officers receive field training under the guidance of an experienced wholetime officer. We welcome this step and urge that similar steps be taken for trainee officers of other departments.

- (ii) Senior seasoned officers should be deputed to go as roving instructors. They should spend some time with the officers—even upto the Divisional Superintendent's level—who are holding charge on the line and guide them in their problems as friends rather than as critics.
- (iii) The officers and supervisors of technical depratments should be so trained as to receive specialised training in particular trades while acquiring broad knowledge of railway working in other fields.

164. We have no doubt that the Railway Board would go into the merits of these suggestions and take appropriate action. We, on our part, would like to add that a young officer is an asset on whom no investment is too heavy to make him professionally competent and a good manager of men.

CHAPTER IV

OTHER STAFF MATTERS

Recruitment procedure and the Railway Service Commissions

165. As a result of the expansion of the Indian Railways in the early thirties and thereafter, it was considered that the recruitment of staff which until then had been made by the Railways through the medium of *ad hoc* Selection Committees set up by them should be discontinued and entrusted to an independent body to be specially constituted for the purpose. Later this principle was enunciated in a report prepared by Shri Frank D'Souza, Officer on Special Duty, Railway Board, who had been deputed to go into the subject of representation of minority communities in the services of the State managed Railways. In this report, he observed that the existing procedure of recruitment was cumbersome and unfair to candidates and therefore the recruitment of railway staff should be made through independent agencies. The Railway Board considered this report and in July 1942, a Commission was set up as an experimental measure for recruitment of subordinate staff on the ex-North Western Railway. After four years of its working, the Railway Board, having been satisfied that the experiment was a success set up other Railway Service Commissions towards the end of 1946.

166. Until January, 1958, when the Northeast Frontier Railway was formed, the recruitment needs of the Pandu region of the North Eastern Railway were met by the Railway Service Commission, Calcutta. Upon the formation of the Northeast Frontier Railway, the recruitment pertaining to the Pandu region was withdrawn from the Railway Service Commission, Calcutta and all fresh recruitment for the entire Northeast Frontier Railway was entrusted to a specially established recruitment committee headed by an officer in the Junior Administrative Grade. Such a committee headed by an officer not below the rank of a deputy head of department has been functioning on the Northeast Frontier Railway since then. Of its two members, one is a senior scale officer of the department concerned and the other a senior scale personnel officer. The latter is a whole-time officer for this work.

167. *Delays involved in selection of candidates*—We had occasion to point out, in Part I of our Report, the heavy delays which take place in the present procedure of making recruitment through the Railway Service Commissions. The Chief Personnel Officers of all the Railways, during their evidence before us, stated that the time-lag between the placing of the requirements by the Railways on the Railway Service Commissions and the receipt of panels of selected candidates is unduly long. The Chairmen of the Railway Service Commissions accepted that the time schedule laid down by the Railway Board is at times exceeded. They, however, attributed this to the system of recruitment according to which the vacancies have to be widely advertised resulting in receipt of an enormous number of applications. The screening of applications for sorting out the eligible candidates, the holding of mass examinations, the interviews and the finalisation of the panels takes a lot of time. Two of the Chair-

men of the Railway Service Commissions, therefore, opined that the time-schedule for selection of candidates should be extended and should not be less than eight to ten months.

168. **The Chairmen of the Railway Service Commissions** drew the attention of the Committee to the fact that panels of selected candidates supplied by the Railway Service Commissions were utilised by the Railway administrations only partially. They pointed out that the utilisation of the panels was only about 50 per cent even after a lapse of one or two years which is the normal currency of a panel. This, they said creates an embarrassing position for the Railway Service Commissions and causes frustration among the successful candidates. To this, the Chief Personnel Officers of the Railways said in reply that the situation was brought about by the long time-lag between the placing of the requirements and the receipt of the list of successful candidates; in the interim period according to them, vacancies were often filled by promotion from among the lower categories of staff and in some cases vacancies were not filled in the wake of economy drive, etc.

169. In reply to a questionnaire which we addressed to the Railways, many Railways favoured decentralisation of recruitment of Class III staff. They said that this would eliminate delays in the recruitment of staff and would enable induction of regional and local bias in selections in the recruitment of lower categories of staff. They also pointed out that added emphasis on regional and local bias in such selections would assist in easing the housing problem.

170. Having seen the heavy delays which occur from the time the original requirements of staff are sent to the Railway Service Commissions until the lists of successful candidates are finalised, we do not see the merit of the present system of recruitment, least of all for mass categories like assistant station masters, guards, train clerks, commercial clerks, etc. We have no doubt that the system of recruitment is not only dilatory but is unable to induct regional and local bias which goes to build a sense of loyalty of staff towards the administration. We, therefore, suggest that recruitment of staff in all mass and semi-mass categories should be left to the Railway administration and the recruitment should be decentralised to be made at the divisional level. We consider that it will be adequate if a committee of two officers is appointed by the Divisional Superintendent to make the recruitment of staff in various categories at suitable intervals. The conditions which brought about the setting up of the Railway Service Commissions do not, in our view, exist any longer. We would further suggest that categories of staff other than mass categories and those for which either the minimum qualification is a university degree or a technical degree or diploma or which are otherwise specialised, as for example, nurses, school teachers, and printing press staff may continue to be recruited through the Railway Service Commissions since in these categories the field of choice would have to be wider and the divisions, left to their own resources and with their restricted jurisdictions, may not be in a position to recruit successfully.

Qualifications for recruitment to certain categories of technical staff

171. Many of the Railways, in their replies to the questionnaire, emphasised that in view of the increasing adoption of costly and sophisticated equipment on the Railways there should be a comparable emphasis

on recruitment and selection of suitable staff for handling and maintaining such equipment. They have expressed themselves in favour of a higher percentage of direct recruits with requisite technical qualifications drawn from the open market. This they suggested in particular in regard to staff engaged in the operation and maintenance of diesel and electric locomotives and also modern signalling equipment. They felt that instead of the present scheme of recruiting trade apprentices with matriculation or its equivalent as the minimum qualification and then training them in railway schools for long period of five years or so, it is advantageous to recruit diploma holders and train them for a year or two.

172. We have already pointed out in a previous chapter that conversion training to steam locomotive drivers is not an easy task. Furthermore, even after conversion training, absence of the necessary background to understand electric circuitry diagrams etc. is wanting in men taken from among steam locomotive drivers. The problem in regard to the minimum technical qualifications for signal maintainers and signal inspectors is almost identical. Here too, by and large, the Railways favoured laying down of certain minimum qualifications for maintainers and for signal inspectors. In regard to maintainers, the view commonly expressed was that the minimum qualification should be matriculation with science. As for inspectors, some Railways felt that the minimum qualification should be science graduates with physics as one of the subjects. Others thought that recruitment to the intermediate grade of signal inspectors should be from graduates in electrical or signal and telecommunication engineering. A few suggested that inspectors in the intermediate grade should be recruited from among diploma holders and in the higher grades directly from among engineering graduates.

173. Similar views were also expressed in regard to the recruitment of staff for operating tie-tamping machine, foremen in the various sections of the workshops and staff concerned with the operation and maintenance of complicated hydro-electric and electrical equipment.

174. While we do not consider ourselves competent to pronounce on the minimum qualifications which any category of staff should possess, we agree that for most of the categories referred to in the foregoing paragraphs, a good basic education and certain minimum technical qualifications are essential so that the staff who are entrusted with the responsibility of operation and maintenance of modern equipment are not raw and uninitiated hands but have an intelligent and effective grasp of the equipment they handle. We suggest to the Railway Board and Railway administrations to evolve the minimum basic qualifications for each of these categories. We have no doubt that in the present conditions, there would be no dearth of men having the requisite qualifications.

Housing accommodation for essential staff

175. Wherever we went we received complaints from staff in regard to non-availability of housing accommodation. Such complaints were particularly common at stations with big concentrations of staff. Some complained that on account of the difficulty of housing accommodation, they had to come to their place of work from long distances. Others said that they had to chum up with co-workers or strangers in single room tenements which made proper rest and family life impossible. Still others said that the rents in the open market were exorbitant which placed them under considerable financial strain.

176. We had, in our questionnaire, asked the Railways to indicate the criteria for classifying the staff as essential for the purpose of allotment of housing accommodation. We were surprised to find that there is no uniformity in the criteria adopted for classifying the staff as essential. According to one Railway, the essential staff are "those whom the administration consider essential". Another has said that the criterion is the "importance and nature of the duties of staff". One Railway considers that it is not possible to lay down a uniform procedure as local conditions vary from place to place. The other Railways have given principles for classifying the essential staff in a very general way.

177. We had asked the Railways to furnish the list of the categories of staff which they consider essential for the purpose of allotment of housing accommodation. These lists make a highly interesting reading. On one Railway, inspectors of station accounts, supervisor lost property office, publicity assistants, vigilance inspectors, peons, daftaries, compositors and deputy superintendent of forms and stationery are considered essential. On another, labour inspector, peons, painters and head draughtsman are included in the essential categories. Another Railway has included among its essential categories, Hindi supervisor, luggage clerk and malaria inspector. In the case of a fourth Railway, we found record sorter, tea-maker, clerk in-charge of canteen and packers appearing among the essential categories. Most of these categories cannot, in our view, by any stretch of imagination, be considered essential for the purpose of priority in allotment of housing accommodation.

178. Of the five Railways who furnished this information, the lists of categories of essential staff run into as many as 355, 408, 97, 451 and 429 categories respectively. The other Railways did not furnish this information.

179. We do not know if the Railway Board considered it appropriate at any stage to define the categories of railway staff who should be given priority in the allotment of houses. Whether or not a definition exists, it is clear that the categories we have referred to above and many more can by no stretch of imagination be considered 'essential'. In our view, the essential staff who should receive preference in the allotment of houses, should be such personnel as are liable to be called for duty at any time, at short notice or at odd hours, and but for whom train running would be immediately hampered.

180. Nor is there any definite principle being adopted in regard to the allotment of the available housing accommodation as between essential and non-essential staff. One Railway maintained that inter-se priority among essential categories of staff was maintained though it has not spelt out the details. Some other Railways stated that a few quarters are earmarked for certain posts and some for non-essential staff. One of the Railways has prescribed that 90 per cent. of the housing accommodation should go to the essential staff and the remaining 10 per cent. to non-essential staff, though it has qualified its remarks by saying that at times exceptions are made. Another Railway has stated that though the rules provide that non-essential staff should not be provided with any housing accommodation until all essential staff have been provided, non-essential staff are allotted quarters when circumstances warrant such a course.

181. In our discussions with the Railway Board, we were advised that of the essential staff (which as pointed out below have not been defined by the Railway Board) about 56 per cent. are housed and there is a shortfall in quarters to the extent of about 3 lakh units for housing the remaining essential staff. The approximate cost of constructing these houses—partly for Class III and partly for Class IV—we were told, would be approximately Rs. 268 crores. As against this, during the last 6 years from 1963-64 to 1968-69, approximately Rs. 46 crores were spent on building staff quarters.

182. The Railway Board conceded that the classification of staff into essential and non-essential categories had been left to the General Managers and no definition of essential staff had been laid down. The Board, however, favoured that amongst the essential staff, a higher priority should be given to running staff like drivers, firemen, assistant drivers, shunters, motormen and guards. To house staff in these categories alone, we were told about 38000 quarters costing Rs. 38 crores would be required.

183. Considering that the available accommodation is inadequate to house even the more essential categories of staff and that it would obviously take a long time to build new quarters in significant number, we would, first and foremost, suggest that the Railway Board should bring about uniformity in the classification of staff as essential and non-essential. Since even among the essential categories, priorities may be different and since it may not be politic to deprive non-essential categories of housing accommodation altogether, we would suggest that a priority schedule may be prescribed in more or less the same manner as a priority schedule for allotment of wagons. The first priority in housing should, of course, go to running staff and the second priority to train passing staff like station masters, switchmen, cabinmen, shunting jamadars etc. Signal maintainers who are likely to be called out at night may also be included in the latter group. The policy in regard to building of new quarters and their allotment should be based on the priority schedule. Even of the existing accommodation, as a rule, all quarters allocated for essential staff should, on vacation, be allotted to essential staff keeping in view the priority schedule. Of the other quarters falling vacant, 50 per cent should be allotted to the essential staff so that a progressively higher percentage of essential staff is housed in accordance with the priority schedule laid down.

184. During our discussions with the Board, it was suggested to us that housing of staff should not be looked upon from a limited viewpoint as the responsibility of the railways alone, but should instead be looked upon as a social burden. The Board therefore suggested that to the extent that money is spent on housing of staff, to that extent the Railway administration should get relief from payment of interest on capital. At the moment, the Railways are required to pay at the rate of 6 per cent on a total capital of about Rs. 3,000 crores. The Board's suggestion was that if relief from payment of interest can be given for the specific purpose of building staff quarters, it may be possible to house the staff within a few years and even if 4 per cent or 2 per cent relief can be given, it may be possible to accelerate the rate of building of quarters substantially. In our view, there is considerable strength in this plea and we would urge the Government to give this matter their closest consideration.

Overtime working of staff

185. We had in Part I of our Report referred to the feature of overtime working of staff which results partly from shortage of sanctioned staff and partly from inadequate leave reserves. The Railway Board observed in regard to this that efforts to fill vacancies would continue and that orders had been issued to the Railways to bring up the leave reserves upto the minimum limits prescribed.

186. During the course of our tours, we received complaints on some Railways that for the category of signal maintainers no rest givers have been provided. When a maintainer is having his weekly rest, the maintainer of the adjacent section is required to attend to the failures of the other side also. There were also complaints that no leave reserves are provided in the category of signal maintainers and that they feel great difficulty in getting leave. Many signal maintainers, in their evidence said that when they reach home after the day's work, they find a note waiting for them asking them to proceed by the first available train to attend to a failure at a wayside station. Most of these witnesses said that they receive such notes often and sometimes twice or thrice a week. They pleaded that they should have a regular duty roster so that they were not required to proceed on work after their duty hours.

187. We would suggest that the work of signal maintainers should be properly job-analysed and if the nature and quantum of work is such that they should be put on a roster of 8 or 12 hours, steps may be taken accordingly. The nature of work of a maintainer is such that he may be required during night or day. If, however, the position is such that a man who may have been working during the day is often required to attend to failures during night also, a more permanent solution of the problem would have to be found since we have no doubt that in days to come, demands on the time of signal maintainers would increase.

Hours of duty of running staff

188. We had, in Part I of our Report, pointed out that according to the provisions of the Rajadhyaksha Award, the maximum hours of running duty should be limited to 12 instead of 14. We had stressed that whenever on any section chronic long hours seem inherent, steps should be taken to change the crew at a suitable place so as not to infringe the prescribed duty hours. We had also referred to a recent directive of the Railway Board to the Railways that the overall duty hours of running staff at a stretch should not exceed 14 from the time of 'signing on' to 'signing off'

189. In their comments, the Railway Board stated that the cases of running duty exceeding 12 hours had been brought down considerably in recent years.

190. During our tours, some of the running staff complained that at times they had to remain on duty well beyond 12 hours. Some stated that on several occasions, even after they had given the prescribed two-hours notice to be relieved, relief was not arranged as none was available.

191. We would urge that vigorous steps should be taken to ensure that 12 hours running duty is ordinarily the limit and that cases of running duty exceeding 12 hours are brought down further and are an exception rather than a rule.

192. The National Federation of Indian Railwaymen had referred forcefully to the feature of long hours on duty and said that most of the accidents occur when staff happen to be on duty for long hours. As it happens, this observation is not borne out by facts. We had in the first questionnaire addressed to the Railways asked them specifically how many cases of accidents were ascribable to long hours of duty of staff according to the accident enquiry reports. The Railways, after reference to individual accident enquiry reports, replied that there were no cases in which the cause of accident had been traced to fatigue due to long hours on duty. In all there have been only one or two cases in which the staff involved had been working beyond their prescribed duty hours when the accident occurred but even in these cases the accident enquiry reports had not ascribed the cause to fatigue arising out of long hours on duty.

193. The National Federation of Indian Railwaymen also pointed out that under the hours of employment regulations, a continuous worker is required to perform 8 hours duty a day, but for the payment of overtime the basis of 54 hours a week and 231 hours in a month is adopted which according to the Federation is 'a strange mathematical approach'. We have no doubt that the trade unions would already have brought up this matter before the Railway administrations and the Railway Board. We, therefore, leave it to the Railway Board to examine the contention of the Federation.

Duty hours of station masters and assistant station masters at stations manned by one station master and one assistant station master

194. A master pointedly brought to our notice during the course of our tours was that at a large number of stations where a considerable number of trains are dealt with there is only one station master and one assistant station master. The assistant station master at such stations, we were told, works permanently at night.

195. We accordingly made enquiries from the Railways asking them to indicate the number of stations which are manned by one station master and one assistant station master and the number of trains which are dealt with at these stations. The position which emerges from their replies is indicated below:—

Particulars of density of train services	Central	East- ern	North- ern	North- Eastern	North- East- ern	South- ern	South- Central	South- Eastern	South- Western	Total
(i) Number of stations dealing with 3 trains	11	1	5	..	17	..	1	3	..	38
(ii) Number of stations dealing with 4 to 6 trains .. .	32	4	48	12	49	..	16	27	46	234
(iii) Number of stations dealing with 7 to 9 trains .. .	9	10	52	33	13	..	27	26	66	236
(iv) Number of stations dealing with more than 9 trains .. .	24	38	39	151	9	139	25	60	153	638
Total ..	76	53	144	196	88	139	69	116	205	1,146

196. On going through the duty shifts of staff at such stations we find that leaving aside a few stations where the assistant station master performs duty in broken shifts or which are closed during night, at an appreciable number of such stations, the assistant station master performs duty for 12 hours covering the whole of night. The number of trains dealt with during the duty hours of the assistant station master varies between 4 and 24 not taking into account a station on the Mughalsarai-Gaya section dealing with 64 trains during the duty hours of the assistant station master.

197. The Eastern Railway explained that at most of the stations, switchmen are posted in the cabins in 8 hours shift and they perform train passing duties independently. The assistant station master on duty at night is in overall charge of the station but he mainly attends to commercial work which is very light. While this may be so, the slide control on the home signal still rests with the assistant station master. This slide control on the home signal with the assistant station master at double line stations came to be introduced at stations with switchmen posted in cabins as a result of the collision at Dumraon. Even with the modified slide control as in vogue on the double line stations of Eastern Railway, the assistant station master on duty cannot but remain active and involved while trains are passing his station.

198. Leaving aside the double line stations, the information furnished by the Railways shows that at a large number of single line stations numerous trains are dealt with at night as for instance at stations on the Bandikui-Rewari and Jaipur-SawaiMadhopur sections of the Western Railway and the Darbhanga-Narkatiaganj section of the North Eastern Railway. According to the information furnished to us, from 7 to 12 trains pass these stations at night. We have no doubt that train running of this magnitude will be keeping the assistant station master fairly occupied leaving him hardly any periods of inaction.

199. During the course of evidence, some Chief Personnel Officers referred to such stations as punishment stations. Others said that job analysis conducted at such stations did not indicate that a justification existed for one more assistant station master. A Chief Operating Superintendent who stated that the assistant station master at such stations had spells of inaction during his duty, also mentioned that during such spells of inaction an assistant station master was inclined to go to sleep.

200. Since such an arrangement in effect means that the assistant station master at such stations is continuously on night duty for months and sometimes years, we have no doubt that this would be a source of considerable dissatisfaction. We had accordingly referred this matter to the Railways. Some of the Railways stated that continual night duty is permissible under the Railway Servants (Hours of Employment) Rules, 1961 and that such staff are classified as 'essentially intermittent'. Even if such an arrangement may be in accordance with the rules, we are unable to see the merit of it. We would urge the Railway administrations to go into this matter closely and find a satisfactory solution. In the absence of any other alternative, perhaps it may be possible to roster the duty shifts of the assistant station master and the station master so that the shifts change at midnight and at 12.00 hours noon, the assistant station master coming on duty at midnight. This would permit the assistant station master to have rest for a part of the night in bed. On sections where traffic is very light

and where there are such stations, the Railway administrations may also examine the possibility of scheduling the trains in a manner that the station is closed during the period say from 22.00 to 04.00 hours so that the assistant station master is not on duty throughout the night as a permanent measure.

Running Rooms

201. We had occasion to visit a number of drivers' and guards' running rooms during the course of our visits to zonal Railways. A complaint often made to us by some drivers and guards was that though the running rooms are meant primarily for guards, drivers, firemen and brakemen, very often travelling ticket examiners, who may be visiting the stations on duty either singly or in squads, occupy the beds available in the running rooms with the result that drivers and guards do not get accommodation on arrival. There were also complaints that several of the running rooms lacked basic amenities like mosquito nets, bed sheets in adequate quantities, utensils and crockery.

202. We understand that as far as equipment of running rooms is concerned, a committee of senior officers had gone into the matter and had prescribed certain yardsticks. These if rigidly applied should, in our view, ensure that linen, utensils and crockery are available in adequate numbers and other facilities like shower-baths etc. also become progressively available for the comfort of the running staff.

203. As far as the accommodation for travelling ticket examiners and conductors is concerned, we think that the administration would be unduly harsh to them if it were to ordain that these categories of staff should not have any accommodation for rest at the end of the journey. At the same time it is important from the point of view of safety of train operation that running staff in the categories of drivers, firemen and guards should not in any circumstances be deprived of adequate rest at the end of their journey. We would, therefore, urge that wherever a complaint of this nature exists there should be separate arrangements for accommodation for travelling ticket examiners, conductors, etc.

Uniforms

204. Innumerable complaints were made to us during our tours by staff who are entitled to uniforms. Apart from complaints in regard to non-supply or irregular supply of uniforms to some staff like firemen, pointsmen, cabinmen, etc., there were some complaints in regard to the uniforms not fitting properly and being either too tight or too loose. Some staff complained that the uniform supplied to them were so ill-fitting that they made them look like clowns. Some even demonstrated this to us by sporting themselves in such ill-fitting outfits. Some pointsmen from the N.F. Railway represented that due to the seasonal characteristics of that region waterproof coats and umbrellas should be supplied to them.

205. Some senior officers pointed out to us that certain categories of staff who should be given uniforms were not so entitled. An Engineer-in-Chief of a Railway, for instance, felt that gangmen should be provided with boots, blankets, waterproofs, etc. On another railway, a signalling officer stressed that the maintainers and khalasis of the signalling department should be given uniforms.

206. We wish to emphasize that when a decision is taken to provide uniforms to certain categories of staff, non-supply or irregular supply of uniforms thereafter is a source of needless discontent and frustration in the staff. Furthermore, a uniform supplied, if ill-fitting, is a stigma on the management. Even though in evidence certain Controllers of Stores had stated that uniforms were being stitched in 20 to 24 standard sizes and an employee should normally find one or the other of these sizes, fitting him, we have a feeling that not much thought is given to this matter. After all, if the commercial ready-made clothing industry finds it possible to cater to most of the sizes by a proper reckoning, study of the average physique and of the market, we do not see why the railway or its suppliers, by similar methods of study should not find it possible to supply to each employee a uniform which fits him more or less to size.

207. We are also of the view that for categories of staff whose work is entirely out-door, raincoats may be provided. Overcoats may also be provided to staff in the categories like shunting staff and gangmen wherever considered justified.



CHAPTER V

RULES, RULE BOOKS AND MANUALS

General Rules

208. We had in Part I of our Report referred to the decision of the Railway Board appointing a Committee of officers to go into General Rules and had endorsed their decision to revise the rules with a view to simplifying the existing set of rules and bringing them up to date. We had remarked that the task is such as would require a detailed and thoughtful study.

209. Rules for running of trains play a vital role in ensuring safety in railway operation. That they should be simple and easy to grasp and remember and be workable in practice goes without saying. In the evidence tendered before us, there were occasional complaints that some of the existing General and Subsidiary Rules are outdated or too complicated. These views were also endorsed by some of the Principals of Training Schools and a few senior railway officers—retired or in service.

210. We have been given to understand that the General Rules are being revised wholesale and a fresh set of General Rules would be available some time next year. While we would welcome a revised set of rules which would provide for the technological changes that have taken place in recent years and suit the requirements of the growing system and from which all the out-dated rules have been weeded out, we would warn against an effort at replacement of a body of rules by another radically and completely different in the general scheme and arrangement of the various chapters and in the basic complexion of rules which has been built up in the minds of staff during the course of their service.

211. In our discussions with the Railway Board we had expressed our apprehensions. We were told that the need for revision was felt as some of the rules were obsolete and impracticable, generally the language was involved and there was plethora of subsidiary rules. We were told that railways in advanced countries have general rules which are much more compact and can be incorporated in small pocket books. The Board assured us that when the new rule books were ready, refresher training and various other steps would be taken to see that the staff get acquainted with new rules fully before they are called upon to work to them. We were also told that during the course of revision which is being undertaken, it has been found necessary to cut out the dead-wood and to eliminate certain chapters relating to obsolete systems of working which are no longer in force on any of the Railways and with the elimination of such chapters and redundant rules, re-numbering of rules would be inevitable to maintain continuity.

212. We can understand that with the weeding out of superfluous rules, some re-numbering would be inescapable. If some way can be found to retain the old numbers for at least the more important rules like those pertaining to giving of permission to approach, taking off of signals, passing of trains in the event of signals being defective, procedure for fog signalling, etc., it would certainly impose a much lighter burden on the staff than if they are faced with a set of rules in which there is no shred of similarity.

213. We, however, realise that the work of revision of rules has already gone sufficiently ahead. Having expressed our apprehensions to the Railway Board we leave it to them to see to what extent the general arrangement of this basic vocabulary of staff concerned with train running can be retained.

214. *Bilingual Rule Books*—We came across a few rule books on some Railways which were bilingual and contained both the English and the Hindi versions of General Rules printed together and bound in the same volume. We are unable to see the merit of this practice. A bilingual rule book would obviously be twice the size of a volume containing rules in one language. A volume of General Rules is a part of the equipment of certain categories of staff as the staff in these categories while on duty may often be required to refer to a rule if necessity arises. Needless to say, any member of the staff would, in case of need, refer to the rules only in the language with which he is familiar; this may be English or Hindi or a regional language. Having versions of the same rules in two languages bound in one unwieldy volume has hardly any use for him and besides, such a procedure would burden him with having to carry twice the weight and the volume of the rule book.

215. We understand that this practice arose because of a directive that all codes, manuals, etc., should be bilingual in character. The spirit of this directive has obviously been misunderstood. There is justification for publication of the statutory rules and codes in bilingual form when required for reference but when a rule book is required to form the personal equipment of the staff, insistence on its being bilingual is ill-conceived. We would suggest that rule books when these are intended to be for the personal use of staff should be printed in English, Hindi or in the regional language as separate editions and the staff may be supplied these books according to their requirements.

Unified manuals

216. We had asked the views of the Railways whether they favour publication of unified manuals applicable to all the Railways on mechanical engineering and electrical engineering practices and procedures similar to the Indian Railways Way and Works Manual and the Indian Railways Signal Engineering Manual. Most of the Railways have favoured the publication of such manuals. Some of them, in fact, said that for want of unified manuals on mechanical engineering and electrical engineering subjects, practices in vogue on the various Railways are different and training of staff is hampered. We would recommend that arrangements may be made for the compilation of such manuals. Efforts should be made to see that there is as wide a ground of agreement among the Railways as possible in regard to the practices and procedures proposed to be unified and incorporated into the manuals.

Hand-books

217. We had an opportunity to see the handbooks brought out by the Railway Board in recent years for different categories of staff, viz., station masters and assistant station masters, guards, switchmen and cabin-men, levermen and pointsmen, gatemen, yard staff and permanent way staff. These handbooks appear to us useful and interesting. We find that the whys and wherefores of rules have been explained and illustrated in a simple and direct manner and the handbooks contain a lot of other information which is of use to the staff in their day-to-day work.

218. We find that on the Railways of other advanced countries like the Japanese National Railways, the American Railroads and the Canadian Railways too, the usefulness of having handbooks for different categories of staff is recognised. We would recommend that similar handbooks should be brought out for the use of drivers, train examiners, route relay interlocking maintainers and panel operators, CTC maintainers and panel operators and staff concerned with maintenance and operation of diesel and electric locomotives, train lighting staff, etc.



CHAPTER VI

PERMANENT WAY

219. The term permanent way has been applied to railway track in all countries since the inception of railways. Actually the only permanent feature of railway track is the alignment as every other component requires to be replaced periodically. Such renewals are necessitated by wear and tear, obsolescence, increased loads and speeds and other factors. Thus after regular intervals which depend partly on the traffic carried and partly on local conditions, the so-called permanent way requires replacement.

220. The track structure including the bridges must not only be able to carry adequately the loads imposed upon it but should be such as can provide lasting service and afford a high degree of reliability against track failures. Modernisation of track involves strengthening of the sub-structure including ballast, provision of improved types of sleepers with better fastenings, introduction of heavier and long welded rails and its mechanised maintenance and inspection. The endeavour of the railway engineers is to provide a track that would need as little day-to-day maintenance and attention as possible. The frequency and speeds of trains and axle loads passing over it broadly determine the extent of work which is required to be done on a track. The frequency and speeds of trains and also the axle loads and the tonnage passing over the track of the Indian Railways have been steadily increasing over the past several years. This necessitated a reappraisal of the existing track standards. We find that a few years ago the Railway Board introduced new track standards specifying increased sleeper densities and ballast cushion. Depending upon the 'gross tonnage' passing over a section annually, the present track standards for broad gauge are 90 lbs (44.61 kg per metre) or 105 lbs (51.89 kg per metre) rails, sleeper density of N+3 or N+6 and ballast cushion of 8 inches or 10 inches. On the metre gauge the corresponding standards are 60 lbs (29.76 kg. per metre), 69 lbs (34.23 kg. per metre) or 75 lbs (37.13 kg. per metre) rails, sleeper density of N+3 or N+6 and ballast cushion of 8 inches or 10 inches. As on 1-4-1968, the length of track on the trunk routes relaid in accordance with revised track standards was reported as under:—

Railway	(Figures in track kilometres)		
	Broad Gauge	Metro Gauge	
	(52 Kg Rails)	(37.13 Kg Rails)	
Central	1,551
Eastern	780
Northern	669
North Eastern
Northeast Frontier	263
Southern	48
South Central	38
South Eastern	599
Western	1,423
		Total	5,614
			1,408

Rails

221. The "gross tonnage" of traffic passing over a section determines the life of rails from the point of view of their renewal. Based on this even the 105 lbs (51.89 kg per metre) rails which have a life expectancy of 400 gross million tonnes may prove uneconomical if the traffic to be carried increases substantially since the time to replace them will come much earlier than it would otherwise be. It is because of this that 60 kg. rails are proposed to be used on sections which carry traffic in excess of 20 gross million tonnes per annum. Since most of these sections carrying heavy density of traffic were relaid in the recent past, the annual requirement of 60 kg rails at this stage is at a level that their rolling has not been found to be an economical proposition by M/s Hindustan Steel Ltd. The rolling and laying of 60 kg rails would apparently therefore take some time to commence on the basis of present planning. We consider that for providing a modernised track structure such rails should be laid not only on sections carrying more than 20 gross million tonnes traffic but also on other trunk routes where the density of traffic may not have reached that level but may be rapidly increasing.

Welding of rails

222. Continuous welding of rails is now a standard practice on the railways in advanced countries because of the advantage of jointless track, namely smoother and more reliable track, thus resulting in greater safety, economy, speed and riding comfort. A rail joint is the weakest point of the track which gets subjected to stresses consequent on action of the wheels rolling over the expansion gaps. Cracks in rails occur more frequently at the extreme ends than at any other point along their length. In addition, the rail joints make travelling noisy and cause riding discomfort.

223. We find that railways in advanced countries have taken to the practice of long welded rails in a big way. In Japan, the New Tokaido Line covering a distance of 515 kilometres is laid entirely, including the bridges, with long welded rails on considerations of running stability, maintenance, etc. In Western Europe also the tendency is the same. In France, until a few years ago, the length of the long welded rails was limited to 800 metres but nowadays the French Railways are going in for much longer rails. Lengths of 1400 and 1500 metres are common and the longest length of welded rails is about 4 kilometres. In United Kingdom also continuous welded rails are an accepted policy.

224. We have been advised that the Railway Board have approved, in principle, the policy of long welded rails on trunk routes and main lines on the Indian Railways at the time of complete track renewal on the section. The Railways having considerable lengths of short welded rails have been asked to examine the possibility of joining up these rails to form long welded rails subject to other necessary conditions for laying long welded rails being fulfilled. Since with long welded rails, the track structure is subjected to stresses over longer stretches there is need for better type of track structure comprised of good formation, adequate ballast and suitable sleepers and fastenings. In view of this durable wooden sleepers with anti-creep bearing plates have been recommended for use on sections to be laid with long welded rails. For sections carrying a quantum of traffic below ten gross million tonnes, steel sleepers can also be laid. We have also been given to understand that if the rails are securely

held and the sleepers are firmly bedded in the ballast both at the sides and at the end, the tendency of the rails to expand or contract with the rise and fall in the temperature can be confined. De-stressing of rails is also provided at suitable intervals.

225. The normal length recommended for long welded rails is 0.8 kilometres or half a mile. Suitable expansion switches are provided at the extremities. We have also been told that, as a trial measure, a single stretch of long welded track of about 11 kilometres has been laid on the metre gauge section on North Eastern Railway.

226. The length of track laid with long welded rails on the Indian Railways was 192 kilometres on 31-3-1968. During the year 1968-69, it was planned that another 125 kilometres of long welded rails would be laid. This to our mind is not a significant achievement.

227. During our discussions with the Railway Board, it was stated that pre-stressed concrete sleepers were particularly suited for long welded rails in view of their greater lateral stability and that the progress of laying of long welded rails was limited by non-availability of concrete sleepers and elastic fastenings. The Board, however, anticipated that the difficulties in respect both of concrete sleepers and elastic fittings would be overcome within a few months.

228. We hope that adequate and timely action will be taken so that the Indian Railways go in for long welded rails extensively particularly in view of the increasing facilities now available in flash-butt welding plants and the experience already gained of thermit welding of rails at site.

Sleepers and fastenings

229. Though the need for developing pre-stressed concrete sleepers had been realised by the Railway Board a long time ago the plans to bring them into use did not materialise for one reason or another. In Part I of our Report we had expressed our scepticism about the expectations of the Railway Board that concrete sleepers would be available in a year's time. Since the time these hopes had been expressed, more than a year has elapsed and we find that our scepticism was not without basis. We are now told that an order for 5 lakh concrete sleepers has been placed with a firm and that supplies would be available soon. We would like to reiterate the need for a firm and long-term integrated plan for the procurement of concrete sleepers as well as the matching elastic fastenings so that the plan for modernisation of track does not suffer on this account. We might add that pre-stressed concrete sleepers are in fairly extensive use in other countries and they have been found to be more durable than timber and give greater track stability because of their greater weight. The French Railways are using these on their fastest and heavily used lines.

230. In reply to a questionnaire addressed by us, the R.D.S.O. stated that studies, investigations and experience of various railways in the world have established that provision of double elastic fastenings to secure rails to sleepers is a vital step in the modernisation of railway track. The use of double elastic fastenings is, according to the R.D.S.O., not only safe but also economical. On the Indian Railways the fastenings hitherto are mostly of the dog-spike or steel-key type.

231. We have been advised that a decision has been taken to introduce double elastic fastenings on the Indian Railways as expeditiously as possible. Arrangements have been made for the indigenous manufacture of Pandrol type of fastenings which are suitable for use with pre stressed concrete

sleepers. We are told that manufacture of these has been undertaken by a firm in collaboration with another British firm. We consider it important to stress that unless adequate steps are taken to ensure that the manufacturers of elastic fastenings fulfil their commitment, it may not be possible to put the pre-stressed concrete sleepers to use. A situation in which elastic fastenings lag behind the supply of concrete sleepers or vice versa would be indicative of inadequate planning and may result in infructuous expenditure.

232. It has also been stated that it is possible to devise a suitable fitting to enable the use of Pandrol type of fastenings with steel through sleepers. Meanwhile, efforts are also being made concurrently by the RDSO to develop a new design of double elastic fastening which could be used both with concrete sleeper and with steel trough sleeper.

233. *Track maintenance*—The maintenance of track on the Indian Railways continues to be mainly manual, i.e. with beater, crowbar and shovel. The instructions laid down in the Indian Railways Way and Works Manual pertain to the various operations involved in manual track maintenance like through packing, picking up of slacks and bad spots, attention to bridge approaches, level crossings and points and crossings, screening of ballast, clearing of side and catch water drains etc.

234. The primary operation in track maintenance consists of packing of sleepers, correcting of cross and longitudinal levels and maintaining of gauge. For this primary operation, different terms are used on different Railways, such as "road opening", "road overhauling", "through packing" etc. We also find that there is no uniformity on the Railways in regard to the periodicity of this primary operation, which we hereafter call "through packing". The Chief Engineer of one Railway stated that two through packings were done in a year. The Chief Engineers of two other Railways stated that the track was through-packed only once a year. One Chief Engineer indicated that in a year it was possible to undertake the second round of through-packing to the extent of about 75 per cent.

235. We had, in Part I of our Report, pointed out that the number of derailments on the broad and metre gauges attributable to track defects during the 5 years, 1963-64 to 1967-68, was 18 and 14 per cent respectively. Of these, more than one-third on the broad gauge and more than one-fourth on the metre gauge were caused by defective points, crossings and turnouts, defective cross or longitudinal levels, badly aligned curves, incorrect super-elevation, kinks in track or incorrect gauge which are all manifestations of unsatisfactory track maintenance.

236. It was stated in evidence that the gangmen of today do not possess the physique which their predecessors used to have in olden days and as such track maintenance by manual method is not as efficient as it used to be. We were also told that poor physique apart, gangmen of today do not have the same pride and interest in their work as gangmen used to have years ago. No wonder, therefore, the maintenance of track has suffered generally in recent years.

237. Within the limited time at our disposal, we carried out some inspections on short lengths of track on some of the Railways travelling by observation cars and we found ample evidence to support what we have stated above.

238. We also inspected some curves and turnouts, bridges, sleepers and sleeper fastenings and a number of level crossings. Even though the observations we made are necessarily of a limited nature, we are convinced that what we noticed is generally applicable to most of the track.

239. In regard to sleepers and sleeper fastenings, we found that often sleepers were out of square, keys of steel trough sleepers were driven rather indiscriminately, sleeper spacings were not according to drawings, some rail joints had nearly run on to joint sleepers due to creep, and correct templates had not been used, the spiking being anything but trapezoidal.

240. The bridges which we inspected, though generally well-maintained, showed that the work of providing guard rails on girder bridges and on some small spans of pre-stressed cement concrete girders had yet to be completed. Instead, guard rails had been provided on earth cushioned arch and flat-top bridges and culverts which, in our view, serve no purpose. Nor were the guard rails fixed according to the instructions issued by the Railway Board. Walk-ways, made out of unserviceable sheets had not been provided on all the girder bridges. Such walk-ways are essential for the train working staff to cross the bridges in emergencies. On one bridge, we found no indication of bitumen or anti-corrosive paint having been used.

241. At some of the level crossings which we inspected we found that the gate-lamps were without masking arrangements. The road approaches were steeper than the limiting grade of 1 in 20 at 'C' class level crossings. The discs fixed to gate shutters were not painted bright red and the catches and stops for gate shutters were ineffective.

242. Even though our observations are limited in character, it is evident from these that a lot needs to be done to improve the general standard of maintenance of track. This assumes greater importance when we consider that conditions have to be created to cope with the present and the future trends of heavier train loads and heavier rolling stock running at higher speeds. It is necessary that the staff entrusted with the maintenance of track are enjoined upon to adhere to the instructions laid down in the Indian Railways Way and Works Manual if the State of the track is to improve. In our view, the programme of track maintenance round the year should aim at the following:—

- (i) The sequence of track maintenance operation should be arranged according to the climatic periods so as to obtain the best results;
- (ii) A reasonable turn-over per unit labour for each specific track maintenance operation should be ensured. Scientific work studies of the various operations would, in our opinion, yield useful results.

243. "*Engineering renaissance*"—The General Manager, South Eastern Railway, told us that a high standard of track maintenance had been achieved on his Railway by systematising the methods of track maintenance. The experiment, we were told, had led to a significant reduction in derailments, more particularly in midsection. On account of the results achieved, the Railway has termed its experiment "engineering renaissance", and is extending it further. The technique adopted is actually simple and is based on job evaluation and merit rating. The Divisional Engineer has to make himself thoroughly conversant with the conditions of his track and the calibre of his men, the particulars of shortcomings existing and the remedial measures required, contemplated or planned for improvement. To this end, he is assisted by a standard questionnaire. During the course of inspection by the

General Manager, the notes prepared by the Divisional Engineer with the assistance of the Assistant Engineer in reply to the questionnaire are critically examined. This critical examination facilitates formulation of the remedial action in a concrete and systematic manner. This method has helped in locating 'soft spots' and in scientifically determining the fitness of mates and engineering supervisors for shouldering their responsibilities.

244. It was suggested that the mechanics of the "engineering renaissance" as enunciated by the South Eastern Railway should be tried by other Railways also. A suggestion was also made that a seminar on the achievement of higher standard of track maintenance by such means be held with the General Managers as the participants. We see merit in the suggestions made by the General Manager, South Eastern Railway and suggest that a wider application of the mechanics of this 'renaissance' in track maintenance may be made over some sections in order to get a correct appraisal of its value and the results placed before the Track Standards Committee.

245. *Ballast and ballast diagrams*—We find lack of uniformity in the preparation of ballast diagrams. While some of the Railways screen the ballast section to full depth over a rail length at every kilometre, others do so at every telegraph post. Some Railways carry out the screening tests every year for preparing ballast diagrams; others do it at longer intervals ranging from 3 to 15 or even 20 years. One Chief Engineer said that ballast diagrams were not being maintained though the ballast requirements were assessed on the basis of screening tests conducted by permanent way inspectors. The Indian Railways Way and Works Manual does not prescribe the intervals at which ballast diagrams should be revised. The deficiency of ballast can be ascertained accurately only by screening the ballast section to full depth upto the formation and assessing the requirements of clean ballast. We consider that the screening of ballast between two sleepers should be done at every quarter of a kilometre taking care that the cores under the sleepers are not disturbed. The results should then be plotted on a diagram showing the clean stone ballast content in the track. The ballast diagrams should be revised once in five years or so. We further suggest that the engineers should test check the requirements of ballast by permanent way inspectors on the basis of ballast diagrams.

246. Clean ballast is a vital factor in safe and satisfactory behaviour of the track. Where ballast is mixed with a disproportionately heavy percentage of dirt, the even packing of sleepers cannot be possible. We would therefore suggest that wherever the content of clean ballast falls below 35 per cent, complete reballasting should be carried out.

247. *Unserviceable sleepers in track*—We find that the Railways generally follow the practice of allowing 20 per cent unserviceable sleepers in the track on wooden-sleepered sections. This practice is commonly confined only to secondary and tertiary lines. Nothing is however specified in regard to the distribution of such unserviceable sleepers. It is evident that with unserviceable sleepers spread indiscriminately over the track, rails, rail joints as well as the serviceable sleepers, are subjected to stresses and suffer damage. We suggest that the percentage of unserviceable sleepers should be reduced to the barest minimum. Eventually, any sleeper that is considered spike-killed or otherwise unserviceable should be promptly renewed.

248. *"Distressed" bridges*—We had asked the Railways for information in regard to the bridges considered 'distressed' on condition basis or on hydrological considerations. From the replies which we received, it is clear

that the Railways do not have a clear conception of what the term 'distressed' bridges implies. The replies to our questionnaire showed that there were in all 1247 distressed bridges by the end of 1967-68. In addition to this, the Northeast Frontier and the South Central Railways indicated that they had 143 and 2439 'vulnerable' bridges as they called them. The South Eastern Railway indicated that their system had 1251 'problem' bridges. Obviously, therefore, there appears to be need for having a uniform conception of when a bridge is to be treated as distressed on condition basis or on hydrological considerations.

249. It is unnecessary for us to stress the need for rehabilitating the distressed bridges even though temporarily safety may be ensured by imposing speed restrictions. On this aspect, the Central Railway mentioned that 8 per cent of their distressed bridges were being rehabilitated. The Eastern and the Northeast Frontier Railways mentioned 25 to 30 per cent and 15 per cent respectively. The other Railways did not furnish this information. In their evidence, however, the Chief Engineers stated that some of the bridges had been rehabilitated or rebuilt and in respect of others either the action had been initiated or investigations were in hand. An accurate assessment of the condition of bridges, we have no doubt, is a continuing process. We urge that the bridges considered distressed should be speedily rehabilitated on a programmed basis, a higher priority being given to structures which require to be rebuilt on age-cum-condition basis.

250. *Gangstrengths*—We had in Part I of our Report referred to the views expressed by the Railway Board that the assessment of gangstrengths on the basis of the 'modified' formula resulted in high figures. We had then been assured by the Railway Board that the whole question of determination of gangstrengths would be reviewed. On our side, we had enumerated the factors which should be the basis for determining the gangstrengths. We reiterate these here:

- (i) Optimum standard of maintenance for each classification of track based on the maximum speed and traffic density;
- (ii) Schedule of work 'round-the-year' for the required optimum standard of track maintenance;
- (iii) Assessment of the requisite number of man-days, based on average out-turn of work for each operation per man-day, to conform to the specified 'round-the-year' schedule;
- (iv) Additional strength required to cover such factors as require extra attention over and above the normal; and
- (v) The optimum length over which a given gangstrength can carry out effectively and without default every track maintenance operation.

251. In their evidence, several Chief Engineers held the view that determination of gangstrengths should be left to the Railways. While we agree that on account of local factors, gangstrengths do vary on different sections of the Railways, we would suggest that the Track Standards Committee goes into the matter and evolves a system of basic strength units according to track classification and the Railway Board are guided by their advice. These basic strength units may be augmented by co-efficients based on local characteristics of various sections of the Railways.

252. We would like to observe here that gangmen mostly live far away from towns and at places where even education and medical facilities are not available. To procure even the basic necessities of life at such desolate places presents a problem. We realise that the difficulties are inherent in the nature of work of gangmen and the problem does not lend itself to an easy solution. Nonetheless, we would urge the Railway administration to do whatever they can to ameliorate their conditions to the extent possible. At the same time, we would suggest that while evolving the basic strength of a gang, the working and living conditions of gangmen should not be ignored.

253. *Curves*—The maintenance of curves to correct alignment including transitions, with appropriate superelevation and cant gradient in proportion to the optimum versine-gradient, needs special care. Experience has shown that at times the running on curves is not as smooth and satisfactory as it should be. At present, realignment of rough-running curves and local adjustments are carried out by the manual method of string-lining. The process of computing the slews after a versine survey, limiting the slews to the very minimum and to zero at 'obligatory' points, is lengthy and demands a fairly high order of expertise which is acquired only through practice. The reconditioning of curves is indeed a matter in which we think it will be greatly advantageous to mechanise calculations. The manual process is time consuming and we consider that in addition to safety considerations, it would be economical to mechanise the calculations. We might mention that in the course of discussions with permanent way staff on different Railways, we found keenness among them to have a mechanised means of maintaining the curves to correct alignment.

254. Two instruments, namely the curve calculator and the curve corrector are at present available for the purpose of calculations connected with maintenance of curves. On some Railways, curve calculators are used. After a versine survey in the field has been carried out, these versines are fed into the instrument. The slews are calculated by adjusting the various pinions. The results are then used in the field for correctly realigning or adjusting the curves.

255. A curve corrector is an 'on track' portable instrument incorporating the features of a curve calculator as well. This 'on track' portable instrument records the versines to full scale continuously over a chord of ten metres or so and can be adapted for use on both the broad and the metre gauges. The versine diagram identifies those points which require correction. The recording device also indicates the slew required outward or inward at each place of adjustment. The corrector is pushed by one man from one end of a curve to the other. The versine diagram is then scanned to determine spots of faulty alignment. It is then pushed in the reverse direction, stops being made beyond each place of adjustment until the curve has been slewed according to the value indicated in the curve corrector.

256. We would suggest that the Railway Board may consider the question of procurement of an adequate number of curve correctors so that an instrument is available for each division on the Railways.

257. After accurate reconditioning of each curve with special emphasis on the transitional approaches, curve alignment registers should be maintained showing therein the versine and superelevation at each "station".

The "stations" should be marked in white paint on the inner side of the outer rail and the superelevation on the inner web of the inner rail. This will not only facilitate supervisory checks but also minor adjustments as and when required.

258. *Turn-outs*—According to General Rule 90, a speed restriction of 16 km.p.h. is prescribed on turnouts. The Rule as it stands makes no distinction between the various gauges nor does it make a reference to the angle of crossing, the track structure or the type of locomotive. Moreover, when the turnout takes off from the inside of a curve, its radius in effect is less than that of a simple turnout and would justify a further restriction in speed.

259. These, therefore, are matters which require considerable study and research to ascertain the stage at which dangerous conditions are liable to occur and to lay down limits of safe speed. We consider that General Rule 90 should be more specific and should be revised in the light of such study and research. We might mention that on the American Railroads, speeds upto 28 miles per hour (45 km.p.h.) have been permitted over the turnouts of 1 in 12 and upto 20 miles per hour (32 km.p.h.) over the turnouts of 1 in $8\frac{1}{2}$. The gauge on the American Railroad is $4'-8\frac{1}{2}''$.

Rail failures

260 As stated earlier, rails are subjected to pounding by, and suffer abrasion due to, the action of the moving wheels. Development of cracks and other defects in rails on the track can therefore not be completely eliminated. In fact, with the increase in speeds and density of traffic and axle loads, the incidence of rail failures would tend to increase but for improvements in the standard of maintenance of track to keep such failures under effective control.

261. We asked the Railways for figures of the incidence of rail fractures during the five years 1963-64 and 1967-68. These figures are shown below:

Year	CR	ER	NR	NE	NF	SE	SC	SR	WR	Total	
1963-64	..	230	149	73	12	1	40	23	26	95	649
1964-65	..	297	138	78	17	11	44	17	22	98	722
1965-66	..	134	161	124	16	5	68	26	56	113	703
1966-67	..	370	172	145	10	13	64	40	17	350	1,181
1967-68	..	401	118	189	5	8	72	31	20	330	1,174
Total	..	1,432	738	609	60	38	288	137	141	986	4,429

262. It will be seen that the incidence of rail fractures has gone up considerably during this period, having registered an increase of about 80 per cent in 1967-68 as compared to 1963-64.

263. Fortunately, derailments on account of rail fractures are rare due to detection of the fracture in time or due to other fortuitous circumstances. When cracks are detected, the rails are removed from the track before rail breakage occurs. In one instance, in recent years, however—between Khandbara and Khatgaon stations of the Western Railway on 17-12-1966—a serious derailment of a passenger train involving loss of life occurred due to a broken rail.

264. Most Railways stated, in their replies to our questionnaire, that keymen during their daily patrol are able to detect a developing Flaw in a rail. The gangmate and the gangmen are also expected to do likewise on the stretches of track on which they work. During the annual greasing of fish plates, the rail ends are examined for cracks which may have developed. On the Eastern Railway, magnifying glasses are used for visual examination of rails on the sections where failures are frequent. Another contrivance in use for detecting flaws in rails by visual inspection is a small mirror which, we are given to understand, is supplied to gangs on certain sections for facilitating visual inspection of parts of the rails which are not otherwise visible. Both the magnifying glass as well as the mirror have a very limited utility as most of the flaws would remain undetected despite the use of these devices. Nonetheless, we consider that these are small and inexpensive devices and should be provided for the use of gangs wherever failures are frequent.

265. If detection of rail flaws must depend on visual inspection, then it follows that to be of use the inspection must be thorough. If the inspection is cursory, it is unlikely that even the more visible of the cracks would be detected by the gangmates and other staff.

266. This, therefore, brings us to the question of more modernised methods of track inspection which depend less on the human element. The RDSO, in their reply to our questionnaire, have advised us that 890 kilometres of track were tested with ultrasonic flaw detectors by the Eastern, the Western and the Northern Railways, mostly in co-ordination with the RDSO. This, it was stated, involved 1,36,454 rails, of which 2,240 were found to be defective. In 1968, ultrasonic testing of rails was conducted for a month on 54 kilometres of track on the Allahabad-Mughalsarai section involving 8,715 rails of which 173 were found defective. The defects consisted mainly of bolt hold cracks at the rail ends. Some other defects like scabbing and transverse fissures were also found.

267. We have been advised that the Railways have, at present, 17 rail flaw detectors of various types like Krautkramer SZ 62, Mitsubishi CM2 and Andigage TR 10. We were told that out of the various types, Krautkramer SZ 62 was found to be the most useful and accordingly an order has been placed on a Bombay firm who manufactures these. The supplies are expected during 1969-70. The instrument will have a few imported components which along with the technical know-how are proposed to be acquired from West Germany.

268. We consider that ultrasonic flaw detectors are essential for detection of rail flaws and would urge that an adequate number of these should be made available for use on the Railways. Annual testing would, in our view, provide an effective practical check though more frequent testing should be carried out where track conditions so warrant.

269. It may, however, be observed that a portable ultrasonic rail flaw detector is capable of limited performance. It operates at walking pace and necessarily its daily coverage is small. In advanced countries, therefore, mobile detector cars have been devised. These cars patrol sections of the main lines at regular intervals. Such cars are already in use on the American main line routes. The Japanese National Railways use ultrasonic rail inspection cars. The British Railways are also developing a self-propelled vehicle with rail flaw detection equipment capable of testing the rails at speeds of 25 m.p.h. (40 km.p.h.). Considering the network of the railway routes in India which would need to be subjected to testing

by ultrasonic rail flaw detection equipment, we suggest that from now on research and development of a self-propelled ultrasonic rail inspection car should be taken in hand so that before long each Zonal Railway has one for use on its system.

270. Most of the failures occur at fish plated rail joints. The surest method of preventing failures at rail ends is to minimise joints by laying long welded rails on trunk routes and main lines. We have, in earlier paras, already stressed this aspect. Apart from the stresses at rail joints, there are other reasons for rail failures. On the manufacturing side, the various possible causes, are brittleness due to chemical composition, in correct cooling rate after rolling which gives rise to transverse fissures, segregation, piping and slag intrusion. In use, rails are affected by increasing speed and density of train service, the packing of ballast under the sleepers which may be inadequate or excessive—particularly at the joints of fish plated track—and weather and atmospheric conditions which result in corrosion. In addition, the age of the rail and the extent to which it has been allowed to wear down also affects its liability to breakage.

271. We suggest that each case of rail failure, as it occurs, receives close attention of the administration by way of chemical analysis, investigation of the previous history of failure of rails of the same type and age and other cognate factors. We are certain that if all rail failures are subjected to this detailed examination, this will not only identify the major causes of rail failures and the local characteristics of sections on which the incidence of rail failures may be heavy but would also indicate the direction in which immediate action is required.

Towards modernisation of track maintenance

272. As we have pointed out earlier, track on the Indian Railways is still maintained by the traditional manual methods. These methods have served the need for speeds, axle loads and density of traffic hitherto obtaining as best as they could but it is now realised that these methods have limitations. With the increasing trends in speed and density of traffic, particularly on trunk and main line routes, a higher degree of reliability of track and better standards of track maintenance become imperative. This, therefore, points to the need for adopting methods of track maintenance which would not only be more efficient but also more economical in the long run. The replies given by the Railways to our questionnaire reveal a remarkable unanimity on the need for modernising methods of track maintenance.

273. We had asked the Railway Board's Office to work out the economics of the various modernised methods of track maintenance. It has been indicated to us that with mechanised maintenance, the saving in cost per kilometre of track would be of the order of 30 per cent. A mechanical tie tamper packs about 300 sleepers per hour though some of the new types of machines have done up to 400 sleepers an hour. In case of measured shovel packing, we have been advised that the saving in maintenance cost per kilometre of track is about 34 per cent and in the case of directed track maintenance approximately 20 per cent. These figures, we are told, are based on the limited trials carried out so far.

Measured shovel packing

274. We had mentioned in Part I of our Report that the method of measured shovel packing is already being tried on the Delhi-Howrah route and that the method has been found to show encouraging results.

This method is widely used on the French Railways as a normal follow-up maintenance of the initial mechanical tamping which is resorted to for initial packing immediately after the track is renewed. All subsequent maintenance is by measured shovel packing. The system has been perfected in France that gangmates are able to assess the lifts required at each sleeper by merely listening to the sound produced by dropping a hard rubber ball attached to an iron handle and noticing its rebound. Although the gangs are equipped with the necessary instruments such as sight-levels, gauges, dansometers, etc., for determining the actual lift required for each sleeper, in practice, the gangs are able to do the work without using the equipment.

275. The Railway Board have expressed the view that as further experience is gained and more staff is trained, measured shovel packing will be extended to main lines where it is not possible to introduce mechanised maintenance in the immediate future. We note the decision of the Board to extend the method of measured shovel packing in the light of experience gained but would like to point out that on the French and some other European Railways the method of measured shovel packing is ordinarily used as a follow-up maintenance of the track after the initial mechanical tie tamping. Even in the evidence tendered before us, it was stated that if, in the first instance, a section of the track is subjected to mechanised maintenance, its subsequent maintenance by measured shovel packing is more satisfactory and lasts longer. We would like the Railway Board to bear this in mind while planning for extending the use of measured shovel packing.

Directed track maintenance

276. We had also referred to the method of directed maintenance in Part I of our Report and said that the method was under trial over a length of 250 kilometres over the North Eastern Railway. Further trials were to take place over other Railways.

277. This method in effect is intended to replace the present practice of routine maintenance of a section by clubbing together of some gangs under the whole-time technical supervision of an assistant permanent way inspector who makes out the day's programme for track maintenance. The actual requirements at various spots of the section rather than a pre-conceived schedule determine the work programme to be followed by the gangs. The effective operation of the methods depends upon identification of track defects and prompt decision being given in regard to rectification of these defects.

278. In the evidence given before us, we did not notice any marked enthusiasm among senior engineers for this new pattern of track maintenance. The main problem which would arise in the course of the general adoption of directed track maintenance would be the transporting of an appreciable number of gangmen with their heavy tools to and from the site of work which may, for some men, be a dozen miles away from their place of residence. It was stated in evidence before us that on certain sections where directed track maintenance has been adopted, gangmen use bicycles to reach their place of work. Apart from the fact that bicycles can hardly be a suitable means of conveyance, particularly where heavy tools have to be carried by gangmen, on several sections it may not be possible to ply bicycles on the cesses. This means of conveyance is thus hardly reliable. Moreover, where men have to be massed together miles

away from place of residence, their reaching the place of work on bicycles would involve a loss of several man-hours. We, therefore, consider it an essential prerequisite of directed track maintenance that suitable means of transport should be available to convey gangmen and their equipment to and from the site of work.

279. We would also like to mention that the supervision required for directing the work of substantially larger groups of gangmen would have to be provided by harnessing the supervision which is, at present, available over shorter ganglengths. To what extent the benefit derived from concentration of effort over a selected length of a few miles of track would outweigh the disadvantage due to the withdrawing of gangmen and their supervisors on many other sections of the track to form a part of directed maintenance scheme and the resultant longer intervals between inspections and slackening of supervision would have to be carefully considered. In this context, we are reminded of trials carried out in the past to ascertain the optimum ganglengths which could be effectively supervised under conditions of increasing traffic and of the fact that a four-mile length of single line has for some years, been a limit. Conditions today, if anything, indicate the necessity for shorter rather than longer lengths for inspection and supervision to be effective.

Mechannised maintenance'

280. We had expressed the view in Part I of our Report that the output of mechanical tie tamping and ballast cleaning machines, when compared to the existing manual methods would justify their continued use. We are told that at present on the Indian Railways, there is only a limited number of 'on track' mechanical tamping machines and that the indigenous capacity, for their manufacture is unlikely to be adequate in the years to come to meet the requirements of railways if they were to adopt mechanised maintenance of track extensively. At present, the position is that about 45 per cent of the cost of a mechanical tie tamper involves foreign exchange. We, however, feel that this factor should not deter the Indian Railways from working out a programme for switching over to modern methods of track maintenance on its trunk and main line routes. The programme would have to take into consideration the economics as well as the safety aspects of mechanised maintenance and of other modern means of maintenance of track so that an integrated plan is worked out and the actual effect of modernisation is felt in the next few years.

281. We would mention that clean stone ballast for an adequate depth below the sleeper is a prerequisite for the working of an automotive tie tamper. This was accepted by the Railway Board. This condition obtains on some sections of the trunk routes but, by and large, on the main and branch lines, the admixture of 'muck' with stone ballast is considerable. It was stated that it will take some time before all sections are made fit for mechanised maintenance. The use of automotive tie tampers will also involve a revised spacing of joint sleepers.

282. We might add that a concomitant of mechanised maintenance is the availability of traffic blocks on busy sections so that automotive tie tamping machines can be put to optimum use. We have, elsewhere in this Report, referred to the need for framing the train time-table on such sections in a manner that a block of time of about four hours can without

difficulty be allotted for mechanised maintenance of track and for maintenance of other equipment. Unless, arrangements to this effect can be ensured, the Railways, we apprehend, will be going in for heavy expenditure in acquiring the equipment in vain.

Inspection of track by modern methods

283. No less important than the maintenance of track is the inspection of track by modern methods. The introduction of heavier trains running at higher speeds makes it imperative that track parameters are measured properly and a careful record is maintained so that track irregularities can be identified and controlled and a high degree of track reliability ensured.

284. We had in Part I of our Report expressed concern over the delay in manufacture of track recording cars and had suggested construction and equipment of test cars on a priority basis for use on the broad gauge and of at least one test car for the metre gauge. The project for manufacture of test cars has been on the drawing board for several years now but the results so far have not been heartening. We feel that if Government are unable to manufacture these test cars within a reasonable time they should not hesitate to obtain them from elsewhere.

285. We were told by the Board that the Hallade track recorder did not serve any useful purpose as it was unable to indicate the defects quantitatively. We were also told that the Hallade track recorder was an out dated instrument and that there was no advantage in going in for it any more. It was said that the divisional engineer, the assistant engineer and the permanent way inspector could as well spot out the defects in track from the footplate. We appreciate the standpoint that a track recording car is superior to the Hallade track recording instrument. It must, however, be pointed out that the only track recording car in use is not designed to function at the high speeds at which the new fast trains are booked to run. Even so, a test with the track recording car does not indicate the alignment and gauge defects quantitatively. Twist and unevenness of surface are however accurately recorded. We consider it necessary that improvements should be affected to enable the track recording car to record all track irregularities at higher speeds accurately. As for the Hallade track recorder, we had mentioned in Part I of our Report that periodical testing of the track is done with this instrument and the charts are scrutinised by senior engineers to ensure their correct interpretation and follow-up action in the field. This portable recorder is a useful instrument for testing the riding qualities of the track at high speeds. The Hallade chart indicates track irregularities qualitatively such as lateral oscillations, low or high joints and sudden sags or humps. We, therefore, urge that steps should be taken to acquire track recorders in adequate number so that each division has one to itself. More than that, the divisional officers and staff should be encouraged to use these instruments intensively and should be trained in evaluation of the results recorded by these instruments so that the maximum advantage can be taken from them. We have been advised that these instruments cost only a few thousands and are readily available.

Half yearly reports by permanent way inspectors

286. During the course of our tours we observed that the half-yearly reports which used to be prepared by a permanent way inspector in a

prescribed form under the various heads namely track, points and crossings, bridges, level crossings, general maintenance, renewals, imprest of stores etc. have since been discontinued. Instead, special reports on the condition of permanent way are now submitted by the permanent way inspector to the divisional engineer as and when they consider it necessary. The form in which these reports are required to be submitted has not been specified. In the evidence given before us, there was diversity of opinion in regard to the usefulness of the six-monthly report. Some officers thought that the reports were useful not only for the permanent way inspector to make a complete appraisal of his charge once in six months but also for engineers at all levels. As against this, it was stated that the report was not serving any useful purpose since it had become a routine and in course of time a bulky statement which was seldom read by the people at the top. We leave it to the Railway administrations to see if the special reports which are now required to be submitted serve the purpose of giving to the divisional officers a fair idea of the condition of the section and of the difficulties of permanent way inspectors; if not, it might be useful to revive the six-monthly report, if necessary in an abridged form, so that a systematic record of the charge of each permanent way inspector is available in the divisional office for the use of the divisional engineers.

Stores workload

287. We had in Part I of our Report referred to the custody and accountal of stores by permanent way inspectors. The Railway Board advised us that the question of providing relief to permanent way inspectors was engaging their attention.

288. During our tours of the Railways, we found much evidence to show that custody and accountal of stores not only claim a lot of time of permanent way inspectors but are a source of considerable anxiety to them and prevent them from giving their undivided attention, energy and time to the maintenance of track—their principal job. The Chief Engineers of all zonal Railways were of the unanimous view that there is definite need for relieving permanent way inspectors of the stores workload. The permanent way inspectors who tendered evidence before us stated that more than the work involved and the time taken in attending to stores in their charge, it is the mental anxiety which the possibility of shortage in the accountal of stores gives to them which diverts their attention from their main function and ties them down to their headquarters when they should be out in the field.

289. The same difficulty was mentioned in regard to the stores charge of signal inspectors. Some of the Chief Signal and Telecommunication Engineers and several Divisional Signal and Telecommunication Engineers stated that inspectors of the signalling department have perforce to spend a good deal of their time and energy in looking after stores to the detriment of maintenance of signalling equipment.

290. We can appreciate the constant worry to which an inspector whose duties are mainly in the field would be subjected by the thought that a shortage in stores can land him into difficulties. The nature of his duties require him to be called from his headquarters almost every day and if he is burdened with stores charge he would be less disposed, if not hesitant, to leave the headquarters.

291. The need for relieving permanent way inspectors of the stores charge has already been accepted. We would suggest that the question of providing relief to signal inspectors in the matter of stores workload should be similarly examined. The relief provided should be in respect of locked and fenced stores for which a person who not merely provides clerical assistance but is senior enough to be fully responsible for the stores, should be appointed. Where both a permanent way inspector and a signal inspector are headquartered at the same station, the person entrusted with the maintenance of permanent way stores can be concurrently responsible for signalling stores. At other places, separate arrangements may be made. But in all cases, permanent way inspectors and signal inspectors should be relieved of their stores charge and should be held responsible only for the imprest issued to and required by them for their day-to-day work.



CHAPTER VII

LEVEL CROSSINGS

292. We had, while dealing with the subject of level crossings in Part I of our Report, occasion to emphasize two cognate questions. The first was the necessity of taking a census of traffic at all level crossings at least once in five years except in special cases, where earlier action might be necessitated on account of any unforeseen development in the intensity of traffic. The second was the necessity of laying down norms which would help the Railway administrations in deciding whether an unmanned level crossing should be manned or whether a manned level crossing should be upgraded. The Railway Board have, in their "Views" on these recommendations, observed that as far as taking of census of traffic at level crossing is concerned, the matter is under consideration. As for prescribing norms, the Railway Board have not favoured this course on the plea that local conditions would weigh greatly in each case. Having taken into consideration what the Railway Board have stated in their "Views", we would like to reiterate what we had said in Part I of our Report.

293. *Census*—A census every five years appears to us necessary since during this period, there may be such changes in the pattern of traffic passing over the level crossing as would justify manning an unmanned level crossing or upgrading an already manned level crossing. It would in our opinion not be right to wait till an accident takes place at a level crossing and only then take steps for taking a census of traffic. It may be useful to have the collaboration and cooperation of the State Government authorities while taking the census; but even if such cooperation is not readily forthcoming, we still think that the Railway administrations should go ahead with taking a census at all level crossings once in five years and in due course convey the results to the State Government concerned in cases where either the manning of an unmanned level crossing or the upgrading of the existing manned level crossing is justified.

294. *Norms for deciding the case for manning an unmanned level crossing or upgrading a manned level crossing*—Having stressed the need for taking a census of traffic at level crossings, we also consider that norms should be laid down for the purpose of deciding whether a case exists for manning an unmanned level crossing or upgrading a manned level crossing. We find from the replies given by the Railways to the questionnaire sent by us, that the basis for determining this is the quantum of road and rail traffic passing over the level crossing reckoned in terms of train-vehicle units, or 'traffic moment' as some Railways term it. This is usually worked out by taking a census of the road traffic passing through the level crossing for seven consecutive days. A pre-determined weightage is then allotted to the various types of road vehicles like motor vehicles, motor trucks, bullock-carts, ikkas, cycle rickshaws etc. and the figures of weighted vehicle units arrived at. The average weighted figure of road traffic for a period of 24 hours is then worked out and multiplied by the number of trains running over the section during the same period to arrive at the train-vehicle units using a given level crossing. The figure is then examined in relation to the norms prescribed to see whether manning or upgrading is called for.

295. In stressing the advantages of prescribing norms, we are not unmindful of the fact that a rigid yardstick or standard is not necessary. The yardsticks to be fixed by the Board may provide for deviations in the light of local conditions on the merits of each case after taking into consideration the need for safety. The existence of norms would firstly provide broad guidelines for the Railways to work upon and secondly, ensure uniformity of procedure at level crossings on the same or contiguous sections having more or less the same quantum of road and rail traffic.

296. Level crossings are divided into five classes, namely, Special, A, B, C and D. Special and A class level crossings are manned by three gatemen working in 8-hour shifts. B class level crossings are generally manned by two gatemen working in 12 hour shifts; C class level crossings may be either unmanned, where justified, or manned by one gateman. D class level crossings are cattle crossings over which vehicles cannot pass and these are naturally unmanned.

297. We have been exercised over those C class level crossings which are manned by only one gateman who is required to work all the 24 hours. Normally, no man, however light his duties may be, can work or remain alert for the passing of trains for all the 24 hours. It is evident that he would have to be away from the gate for his various needs both during the day and the night. If he is conscientious, he would shut and lock the gate before leaving, but this would cause unnecessary detention to road traffic; on the other hand if he is careless, he would leave the gate open and the road traffic must fend for itself as if the crossing is unmanned. We are therefore unable to see the merit of a system in which certain gates are manned by only one gateman. To us it appears necessary that there should be at least two men in 12-hour shifts at each manned level crossing. Then alone can it be reasonably expected that the gateman would perform the duties prescribed for him in a proper manner.

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298. We had, in our discussions with the Railway Board, placed before them the proposition that at all level crossings where at present one man works round the clock, either two men should be posted where traffic justifies this or alternatively the man must be removed and the gate may become an unmanned level crossing. The Railway Board agreed to this proposition readily. We would here reiterate that at C class manned level crossings with only one gateman, an appraisal of the traffic using the gate should be made speedily and depending on the result, the Railway administration should decide whether a case exists for having two men at such gates or whether the gate should be unmanned. In no case, in our view, should a gate remain with only one man on duty all the 24 hours.

299. *Railway Safety Works Fund*—We had referred, in Part I of our Report, to the Railway Safety Works Fund and suggested that a part of it—to the extent of 10 per cent—should be made available to the Railways in case a decision is taken to man an unmanned level crossing or to upgrade an existing manned level crossing. The Board had stated on this recommendation that the matter had been taken up with the Ministry of Finance and action was in progress for evolving a suitable procedure. We hope that a satisfactory solution has since been found which would enable the Railway administration to draw directly from this Fund upto the extent of 10 per cent for the above purpose.

300. Warning devices at manned gates—Another question that arises with respect to manned level crossings is the difficulty which a gate-man experiences in the matter of ascertaining when a train is to pass. Passenger trains run to a fixed time table. Even so, a passenger train may be running late. Goods trains on the other hand do not have any fixed schedule. The gate-man is ordinarily unable to ascertain when the train would pass his level crossing if it is situated in midsection. Except in special cases, there is usually no communication between the gate-man and the station master on either side of the level crossing gate. The gate-man is therefore left to himself to judge either by the sound of a whistle or the far-off smoke or even some times from the aspect of a far-off signal if a train is approaching. Very often none of these clues is there to guide him and to play safe, he is apt to close the gate against road traffic on his own judgement resulting in needlessly long detentions to road traffic. On the other hand, were he not to adopt such a course, there is the likelihood of an accident taking place should a train suddenly bear down upon the level crossing taking the gate-man and the road users unawares. To us, therefore, it seems imperative that some form of communication between the gate and the station on one side or the other should be available so that the gate-man knows in advance when a train is expected. This communication may be in the form of a telephone or a warning bell which can be rung to indicate to the gate-man that a train is coming. Another alternative would be warning bells which are actuated by approaching trains but we realise that in respect of such automatic warning bells, there is danger of theft or vandalism. We therefore favour some kind of reliable communication between the gate-man at a midsection level crossing and the station on one side or the other to save road traffic from long and irritating detentions to the extent possible and at the same time to ensure safety.

301. So far as level crossings within the station limits, whether interlocked or non-interlocked, are concerned, these are controlled by the station master and in their case, reliance has to be placed on the station staff to minimise detentions to road traffic. For this purpose, the station staff must be educated to see that signals are not taken off much in advance of the approaching or the departing train.

302. Signals at midsection level crossings—We are informed that on some sections which are equipped with multiple aspect signalling, a few interlocked level crossings in midsection are provided with lower quadrant two aspect signals. It is essential that there should be uniformity in the type of signalling provided on a section. We suggest that at such level crossings the lower quadrant two aspect signals should be replaced by multiple aspect signals.

303. Barriers at manned level crossings—We are also of the view that all important level crossings should be provided with sympathetic barriers of the lifting type equipped with eccentric wheels which actuate bells and flashing lights indicating to the road users when the barriers are being lowered or raised.

304. Automatic half-barriers—We had occasion, in Part I of our Report, to refer to the proposal for the installation of automatic half-barriers and had observed there that we would revert to the subject in the second part. It appears that the proposal for the installation of automatic half-barriers along with the provision of suitable types of bells and road-

flashing signals was investigated by the Research, Designs and Standards Organisation. It was intended to experiment with an automatic half-barrier as designed by the Research, Designs and Standards Organisation at a level crossing in New Delhi and in some other places. For this purpose, the RDSO had also sought the assistance of the Central Road Research Institute who in turn had in consultation with the Railways and the civil authorities at Delhi designed proper geometrics for the approach roads to the level crossings to ensure proper flow of traffic. Later, however, it appears that the Board dropped the idea of installation of automatic half-barriers on the ground that they were not suitable for Indian conditions.

305. We have given further thought to the matter. It would, in our opinion, be worthwhile experimenting with automatic half-barriers to see if they can successfully take the place of manned level crossings with due measure of safety. The advantage of an automatic half-barrier is that it affords the maximum freedom of movement to road transport. The only snag lies in the possibility of the road user digressing from the queue and zigzagging his way through the open half of the level crossing and then coming to grief for his rashness.

306. In this connection, we consider it relevant to refer to the experience of the cities where automatic red and green signals are installed at crossroads. The experience, generally speaking, has been that signals are obeyed and the road using public in such cities cross the road crossing in an orderly manner even if no constable may be on duty. What is more significant is that there are no barriers on the road. Whenever the automatic red light comes on, the traffic comes to a stop to let the other stream of traffic pass. We are, therefore, disposed to think that at least near about the cities where automatic light signals are in use at road crossings and the road users have got used to them, the Railways may with advantage and without undue risk experiment with automatic half-barriers.

307. We understand that the cost of an automatic half-barrier installation is approximately Rs. 40,000. If eventually these automatic half-barrier crossings turn out to be a success, they would not only be more economical inasmuch as the recurring costs of manning the crossings would be saved, but would also be a source of considerable relief to the road user since the hold-up to road traffic at such level crossings would be the minimum possible.

308. We would stress that while installing automatic half-barriers, conditions should be created by which breaking of the queues and zig-zagging by road users is rendered difficult if not impossible. It may be necessary to fix small raised and prouded blocks with a height of six to twelve inches in the centre of the road on both approaches to the level crossing for an adequate distance. If such blocks exist on either side, the road user would ordinarily have no alternative except to obey the barrier. It may even be necessary to post a man at such level crossings in the initial stages to watch the behaviour of the road user. Ultimately, of course, the success of an automatic half-barrier depends on the good sense of the road user who must realise that the installation is primarily for his benefit so that he is not detained at the level crossing.

309. We might add that in the United States of America, the experience has been that the accident percentage at crossings provided with half-barriers is the lowest. In Japan automatic lifting half-barriers are

extensively used on class I level crossings. In France too, automatic half-barriers have become popular. In the United Kingdom, unfortunately, the installation of automatic half-barriers received a set-back after the Hixon automatic half-barrier disaster in January, 1968.

310. We also suggest that provision may be made for the prosecution of those road drivers who disregard the automatic half-barriers in the same way as a road driver is liable to prosecution if he ignores traffic lights.

311. We would like to add that if the experiment is to be made a success, special care will have to be taken to guard against vandalism and theft of ground equipment. It is important that wherever such automatic half-barriers are installed and are actuated by approaching trains, the installation works in perfect order and safety is not endangered. We were told during our visit to the RDSO, that it is possible to instal the ground equipment in a manner that it would be virtually impossible to pull out anything worthwhile and in any event the installation is based on the fail-safe principle. All the same we feel that should the installation fail far too often, even on the fail-safe basis, the respect which the road user may have for the installation is likely to decline resulting in the experiment not proving a success.

312. *Future policy in regard to new level crossings*—So far as the future is concerned, it must be realised that level crossings are a necessary evil—evil because they cause detentions to road traffic and occasionally even to trains and also involve expenditure on gatemen whose labour is in reality unproductive; necessary because it may not always be possible to have under-bridges or over-bridges in all cases. Even so, we are of the opinion that from now on the construction of level crossings should be avoided wherever possible and reduced to the barest minimum. The need for avoiding level crossings will, in future, arise wherever new railway lines are laid across the existing roads or where new roads are made to cross the existing lines. In such cases, the rule should be to provide either an under-bridge or an over-bridge depending upon the topography of the place. A level crossing should be provided only when, for some unavoidable reason, it is not possible to have an over-bridge or an underbridge. The expenditure involved, we would stress, should not be the sole reason for rejecting this course. The amount collected in the Railway Safety Works Fund, would, we hope, be available to be utilised in future to avoid the necessity of creating new level crossings particularly where heavy road traffic is expected to pass over them.

CHAPTER VIII

SIGNALLING AND INTERLOCKING

Note of signalling

313. Next of course to a careful man, the one single factor which more than any other makes for safety in train running is proper signalling. A majority of accidents take place because somewhere someone engaged in the running of trains makes a mistake. Signalling devices are intended to act as a check on such human fallibility. The techniques of signalling have indeed advanced to-day to an extent that it is possible to eliminate the chances of fallibility of the human element to a degree not conceived of a few decades ago. Such modern techniques have helped to promote not merely safety in train operation but also efficiency and speed. The extent to which such techniques can be adopted as also the tempo of advance is, however, limited by considerations of financial and material resources available.

314. The Estimates Committee of Parliament in its 33rd Report in 1956, had expressed the opinion that there was vast scope for improvement in working on Indian Railways by introduction of modern methods of signalling and interlocking. Seven years later, the Kunzru Committee had regretted that the provision of signalling on the Indian Railways continued to be archaic in conception, lacked boldness in planning and was halting in execution. We, on our part, had not without sufficient reason, remarked in Part I of our Report that the progress in the introduction of modern signalling on the Railways had been slow. Despite such critical comments, however, we find that the position continues to be disturbing.

315. With a view to examine if signalling is receiving its due share of importance we had made a brief survey of the investment made on the principal categories of developmental works including modernising of signalling equipment on the Indian Railways during the three years 1965-66 to 1967-68. The investment on signalling and interlocking works vis-a-vis the investment on the principal categories of development works—budgeted and actual—is shown below:—

Year	(Figures in millions of rupees)						
	Total investment on the Principal categories of development works		Investment on signalling and interlocking works		Percentage of 3 to 2		
	(1) Budgeted	(2) Actual	(3) Budgeted	(3) Actual	(4) Budgeted	(4) Actual	
1965-66	2641.61	2822.91	105.79	102.52	4.00	3.63	
1966-67	2368.40	2202.08	116.47	99.43	4.92	4.52	
1967-68	2265.35	2002.02	111.45	98.52	4.92	4.92	

Note.—The development works selected for the survey are shown below—

- (i) Rolling stock.
- (ii) Machinery and plant.
- (iii) Track renewals.
- (iv) Bridge works.
- (v) Traffic facilities.
- (vi) Signalling and interlocking works.
- (vii) Workshops.
- (viii) Electrification and other electrical works.
- (ix) New lines.
- (x) Restoration of dismantled lines.
- (xi) Other specified works.

316. These figures bring out clearly the inadequate appreciation of the role of modern signalling in promoting safety, economy and efficiency in railway operation. Of the total capital expenditure on the principle categories of developmental works undertaken by the Railways, only about 5 per cent fell to the share of development in signalling. On most of the Railways, the proportion ranged from 4 to 6 per cent. This in our view is inadequate.

317. A further analysis of expenditure on different types of signalling development works is shown in Annexure IV. Summarising this analysis under three main heads, viz., modern signalling, other signalling development works and telecommunication, the percentage of expenditure on each to the total expenditure on signalling and telecommunication works during the 3 years 1965-66 to 1967-68 was as under:—

Year	Modern signalling works		Other signalling development works		Telecommunication	
	Budgeted	Actual	Budgeted	Actual	Budgeted	Actual
1965-66	38.31	39.40	56.30	56.58	5.39	4.02
1966-67	55.06	54.47	37.88	40.77	7.06	4.76
1967-68	46.81	47.08	35.15	34.11	18.04	18.81

(These figures do not include those for the South Western Railway as this Railway did not furnish the requisite details.)

318. It would be seen that even out of the expenditure on signalling development works—budgeted as well as actual—a substantial portion is on “other signalling development works”. The expenditure on modern signalling techniques viz., track circuiting, route relay interlocking, colour light signalling, automatic train control, centralised traffic control and automatic block system, works out to less than half the amount. We consider that this imbalance reflects not merely a lack of appreciation on the part of the Railway administrations of the role of modern signalling from the point of view of safety but also a lack of realisation of the fact that unless signalling keeps pace with developments in other fields, the Railway administrations would be unable to realise fully the advantages of developments in other fields and would be unable to put to the fullest possible use their growing assets.

319. It may perhaps be argued that the present allocation for modernisation is adequate taking into account the resources for indigenous equipment. As would be seen in subsequent paragraphs, the hopes which the Railways entertained about the private sector to whom they had turned somewhat belatedly, developing indigenous manufacture of sophisticated signalling equipment and due to which they forewent development of capacity in a workshop of their own have not materialised. At the same time, these expectations seem to have conditioned their thinking so as not to go in for imported equipment. In the evidence tendered before us, several senior railway officers admitted that signalling on Indian Railways could be put into better shape if import of equipment was allowed until indigenous capacity got built up. We cannot help remarking that in the name of indigenisation, proper integrated planning in the field of modern signalling has been lacking. We would urge that without any further loss of time, a firm plan integrating the requirements of the Railways, the indigenous resources available and the imports needed should be drawn up with boldness and vision for the next five to ten years and the programme of each year should reflect the attention which modern signalling deserves but which it has not quite received in the past. Only then will the Railways be able to make up for the time lost in this vital field.

320. Having made these general observations, we now proceed to deal with some specific aspects of signalling and telecommunication.

Visibility of signals

321. *Colour light signals*—The importance of proper visibility of signals is hardly a matter which we need dwell upon. During our tours, it was repeatedly represented to us that the visibility of colour light signals is far better than that of the conventional oil-lit signal lamps. Colour light signals throw a beam of light of such intensity that their indications are clearly seen by drivers from a long distance even in bright sunshine. The penetrating nature of their beams makes it possible for the drivers to see the signals and identify them even in adverse weather conditions. We recommend that on sections where electric power is available, colour light signalling should be provided as rapidly as possible.

322. Some drivers whom we met during our tours complained about the bad visibility of even colour light signals during day time. We were given to understand by some senior railway officers during their evidence that the quality of the indigenously manufactured lenses and bulbs has not been altogether satisfactory in the past and that orders have been issued for rigid inspection even if it meant large scale rejection. We consider that a rigid check should be exercised on the quality of lenses and bulbs used in colour light signals.

323. *Semaphore signals*—A retired Member of the Railway Board stated during his evidence that one of the reasons for the disregard of signals by drivers was that signals were not correctly focussed and adequately lit. Drivers also complained frequently in their evidence about the dim light of oil-lit signal lamps. We find that the question of electric-lighting of semaphore signals had been dealt with in a meeting of the Signal Engineers' Sub-Committee of the IRCA as far back as November 1938 and at that stage it was thought that the question was essentially an economic one. Since then, little seems to have been done on this score.

324. We were, while on a tour of the South Eastern Railway, informed by the Divisional Superintendent, Khurda Road that electric lighting of semaphore signals at a few stations on that division had been experimented with and had shown satisfactory results and that it was proposed to go ahead with this transition at other stations where electricity was available. The failure of power had been catered for by stand-by batteries. We urge that the Railways explore the possibility of switching over to electric lighting of semaphore signals wherever it is feasible and that economic considerations should not be allowed to stand in the way where the question of improved lighting and visibility of signals is concerned.

Pre-warning of stop signal

325. As we had pointed out in Part I of our Report, the policy of the Railway Board is to provide multiple aspect signalling of the upper quadrant or the colour light type as may be suitable on trunk routes on a programmed basis. Since the advantages of this type of signalling over the conventional two-aspect lower quadrant signalling have already been recognised and established, we suggest that a more progressive policy of providing multiple-aspect signalling at stations not only on trunk routes but also on main line routes should be followed.

326. On a considerable length of track on the Indian Railways, the two-aspect lower quadrant semaphore signalling is still in use on sections with heavy density of train services and ever-increasing speeds but these have not been programmed for provision of multi-aspect signalling. We were given to understand that it has been proposed to separate the warner signal from the outer signal on some sections and to place the warner signal at a distance of 1.5 kilometres outside the outer signal so that the driver gets a pre-warning before he comes upon the first stop signal. As an interim measure, we consider it as a step in the right direction but stress that the ultimate objective should be to go in for multi-aspect signalling on such sections.

Braking distances and Sighting boards

327. *Braking distance trials and resiting of signals*—We had, in Part I of our Report, suggested that the distance between the distant and the first stop signals on high-speed routes and the length of the signalling section in automatic signalling territory should not be less than the emergency braking distance. We were informed that while braking distance trials on the broad gauge had been conducted, those on the metre gauge were in hand. We hope that the results of these trials are now available and would soon be reflected in the resiting of signals.

328. Several witnesses who tendered evidence before us stated that the minimum sighting distance for the first stop signal without pre-warning in two-aspect lower quadrant territory should be the braking distance plus the distance equivalent to the reaction time. Whatever the system of signalling, it goes without saying that signals must be clearly visible to a driver from as far off as possible so that the driver is able to observe and obey them in time. For a long while now, the need to resite signals has been linked up with the braking distance trials in progress. We would urge that this matter which seems to have been long delayed should receive the urgent attention of the Railway authorities.

329. *Sighting boards*—Sighting boards are provided alongside the track to alert the driver of the approach of the first stop signal. On some sections, separate sighting boards are provided for passenger and goods

trains. These sighting boards are at present painted with ordinary enamel paint which has very limited visibility. We were told that efforts at indigenous development of reflective strips were being made. We find that such efforts have been going on for the past several years and not only has no finality been reached in the matter but the indications are that indigenous development may not be possible for many years. We consider that improved visibility of sighting boards is essential so that the attention of the driver is drawn to them particularly at night and at times when visibility is impaired. We have been given to understand that at the cost of a small amount of foreign exchange it would be possible to import suitable reflective material like scotchlite. We consider that in matters which involve safety, considerations of foreign exchange should not be allowed to come in the way. In any case, for import of reflective material as we have pointed out, an insignificant amount of foreign exchange would be involved.

330. It also occurs to us that in addition to sighting boards, such reflective material may be used with advantage on whistle boards, road signs on the approaches to level crossings, speed and caution boards and other indication boards which ordinarily are not lit at night.

Block instruments

331. During the course of our tours, we found that there is multiplicity in the types of block instruments in use on double and single line sections of the various Railways. On some Railways a large number of different types of block instruments is in use on various sections. In the zonal training schools which we visited, we had evidence to this effect. From the viewpoint of staff responsible for maintenance and operation of block instruments, diversity in the types of block instruments is disadvantageous. We suggest that action should be taken to see that the types of block instruments in use on any one Railway should be reduced to the minimum. It would be advantageous to have one type of block instrument for use on double line and another on single line. This would incidentally help in weeding out the types of block instruments which have become obsolete and have outlived their useful life.

Centralised operation of signals and points

332. *Panel interlocking*—We find that already on the Railways, at some of the busy way-side stations where electricity is available and colour-light signalling is provided, panel interlocking wherein the operation of signals and points at the station is centralised and controlled from a panel installed in the station master's office is provided. This not only increases the element of safety by providing electrical controls on points and signals but is an economical means of regulating trains at the station since the station master has complete control over movement of trains within the station and can operate the points and signals single-handed. We recommend that panel interlocking with colour light signals may be provided at stations on electrified sections and on such non-electrified sections wherever electricity is available.

333. *Route-Relay interlocking*—At important junction stations and terminals where a large number of trains are dealt with, ordinarily the control of train movement is spread over a wide area and a large number of persons are associated with the movement of a train. Coordination between various persons and cabins increases the possibility of human failure and in any event such coordination becomes time-consuming. Route relay interlocking aims at abolition of dispersal of the control among various

persons. Apart from substantial saving in staff, it also permits safer and more efficient train operation. The central operator is able to direct the movement of trains within an enlarged area by setting the routes and operating the signals.

334. We find that in recent years, some progress has been made in providing route relay interlocking at important junctions and stations. We had, during our tours of the Railways, occasion to visit some of the route relay interlocking cabins. We recommend that the pace of provision of route relay interlocking should be accelerated not only to speed up operation but to enhance safety.

335. Of course, with the concentration of so much work at a single focal point, serious dislocation of traffic may take place, should a minor fault like a track circuit failure occur. We would therefore suggest that in yards provided with large route relay installations, subsidiary signals which serve the purpose of calling on signals may be provided below the relevant stop signals with post-type telephones to save detentions which occur on account of piloting of trains when a stop signal becomes defective or inoperative. This in our view would be a safer practice than the piloting of a train and would also help to eliminate the undesirable practice of bridging of the contacts which the staff resort to at times in order to save detentions.

336. We also find that so far the route relay installations provided at different stations have been of different types having been installed in collaboration with different firms. The route relay interlocking installation provided at Kurla was in collaboration with a British firm, at Madras Central with a Japanese firm, more recently at Delhi with a French firm, at Howrah with a Swedish firm and more recently at Kalyan with a German firm. Each firm has used its own design of equipment and circuitry. This arrangement poses serious problems of availability of spares and the need to stock a variety of equipment besides training of staff. In our view, the need for standardisation of designs, specifications and requirements for future installations of this type is paramount.

337. *Centralised traffic control*—A step further is the centralised traffic control system or CTC for short, in which the movement over a whole section is centralised at one focal point. Here the CTC Controller or Operator is the central figure to whom the position of various trains on the section controlled by him is conveyed automatically and instantaneously on a large-sized panel in front of him. He not only makes decisions in regard to the movement of trains, their crossing or precedence or where to shunt a train and when but also sets the route and clears the signals as required. The installation is a series of small power-relay interlocking units stretching over a hundred miles or more with their individual controls concentrated at the central control point. The electrical controls and relay interlockings are so designed that it is virtually impossible for the operator to set conflicting routes which would endanger the safety of trains. In addition, an automatic train graph recorder records the movement of trains and should a driver pass a signal at danger the graph enables a check to be made. The knowledge of this continuous watch is sufficient to keep the driver vigilant.

338. So far we find that CTC has been installed on only three sections. On the US Railroads, however, CTC we understand has in practice been found to be so efficient in operation that some main line sections have been converted from double line to CTC operated single line. We consider that CTC is an important development to meet the demands of greater

safety and efficiency and we hope that in future whenever due to an increase in the density of train service on a single line section the question of creating additional capacity is examined, the case for installation of CTC would be duly considered keeping in view the additional safety factor which such installation provides.

339. During our tours on the North Eastern and Northeast Frontier Railways, we had occasion to visit the Centralised Traffic Control rooms. We found that the present system does not indicate to the CTC Operators the nature of the train on the section, that is, whether it is mail or express, a passenger or a goods train. All that he knows from the panel is that there is a train on the section. The description of the train helps the Panel Operator to regulate the different types of trains in the matter of reception, crossing or precedence. We were advised that a 'train describer' was not an essential component of CTC but was definitely an aid to the Panel Operator. We were informed that a 'train describer' which would simultaneously convey the direction of movement was proposed to be provided on the CTC Panel on Madras-Tambaram section of the Southern Railway. We were also advised that the addition of this feature can be made at a small cost. We consider that such 'train describers' should form part of CTC wherever it is installed.

Track circuiting

340. Train collisions as we have seen take place mainly due to the carelessness or forgetfulness of either the station staff or the train driver. As to the former, the solution, apart from interlocking, would lie in track circuiting. A track circuit is an electrical device to prove the occupancy of a line or a section so equipped, by a train or a vehicle. The length of track on which the occupancy is required to be proved is isolated electrically from other lines. The track is equipped with necessary electrical connections and circuitry so as to give visual indication to the cabinman and/or the station master as to its occupancy or otherwise. On our Railways, the electric isolation of the two rails from one another is achieved by the use of wooden sleepers though in some foreign countries steel trough or pre-stressed cement concrete sleepers with pads made of insulating materials inserted between the rails and the sleepers are also in use. The visual indication provided not only shows whether the line is occupied but the circuitry also ensures the locking of the relevant points and prevents the relevant signal or signals from being taken off as long as the line is occupied.

341. The Railway Board had adopted the policy of providing track circuiting on a phased programme years ago. We obtained from the Railway Board information in regard to the provision and programming of track circuiting of stations on the trunk routes, main lines and branch lines. The detailed position indicating the planning yearwise is shown in Annexure V. Summarised, the position is as under—

		On trunk routes	On main lines	On branch lines
A. Total number of block stations	.. .. ..	1,652	1,873	2,303
B. (i) Number of block stations provided with track circuiting				
1. On all passenger lines	.. .. ..	279	108	33
2. On run through main lines	.. .. ..	271	23	..
(ii) Number of block stations at which track circuiting work is in progress—				
1. On all passenger lines	.. .. ..	38	8	2
2. On run through main lines	.. .. ..	135	6	..

			On trunk routes	On main lines	On branch lines
<i>(iii) Number of block stations which are programmed for provision of track circuiting during 5 years from 1968-69 to 1972-73</i>					
1.	On all passenger lines ..	..	112	6	1
2.	On run through main lines ..	..	775	6	..
<i>(iv) Number of block stations to be provided with track circuiting but not yet programmed—</i>					
1.	On all passenger lines ..	..	..	..	..
2.	On run through main lines ..	..	42	..	..
<i>Grand total of B (i) to (iii)—</i>					
1.	On all passenger lines ..	..	429	122	36
2.	On run through main lines ..	..	1181	35	..

342. It will be seen that of the 1,652 stations on the trunk routes, at 429 stations all the passenger lines would be track circuited and at 1,81 stations the run through lines by the end of 1972-73. Similarly of the 1,873 stations on the main line routes, 122 stations would be track circuited on all the passenger lines and 35 on the run through lines. By the end of that period, 36 stations out of 2,363 on the branch lines would also have been provided with track circuiting on all passenger lines. In other words, four years from now there would still be 42 stations on the trunk routes, 1,716 stations on the main line and 2,327 on the branch lines without track circuiting.

343. The Railways in their replies to our questionnaire have indicated that the main difficulty in extending track circuiting is the shortage of wooden sleepers. The present policy of the Railway Board, as pointed out in Part I of our Report, is to provide track circuiting on run through lines of stations on the trunk routes at the rate of 200 stations per year. During our discussions with the Railway Board we were told that during the last two or three years, track circuiting could be provided on run through lines at the rate of 130 to 140 stations annually and that financial stringency and the shortage of wooden sleepers had militated against fulfilment of the target. It was pointed out to us that the first draw on the available supply of wooden sleepers had to be renewals on sections which are already track circuited and that only the balance can be used for extending track circuiting on new stations. It was further pointed out that bringing into use of pre-stressed concrete sleepers would have only a marginal effect in easing the shortage of wooden sleepers since concrete sleepers being thicker than wooden sleepers are not entirely suitable for track circuiting in yards as they create problems in respect of drainage, overhead structures, etc.

344. We cannot help expressing our doubts whether the Railways are addressing themselves to the task with the necessary sense of urgency. We had in Part I of our Report expressed our apprehensions about the Railways' ability to achieve the target of 200 stations per year laid down by the Railway Board. As already pointed out, the target has not been achieved. Our apprehensions have thus come true. It also appears to use that too much is being made of the shortage of wooden sleepers and that this factor instead of being a source of anxiety has, in course of time, come to be a cause for complacency. If wooden sleepers are in such short supply, it is inescapable that the Railways must concern themselves with alternative means to overcome the hurdles in extending the use of track circuiting.

If the shortage of wooden sleepers is as real as is made out to be, it is equally apparent that this is a situation with which the Railways have to live in the years to come. Means, therefore, would have to be found to do without more wooden sleepers. We have no doubt that with more energetic research and experimentation, it should be possible to evolve suitable alternatives and overcome the hurdles in extending the use of track circuiting. We also feel that the difficulty pointed out in regard to the unsuitability of concrete sleepers in yards would apply to only a few places and, by and large, it should be possible to overcome this difficulty.

345. We made a study of the collisions which took place during the year 1967-68 and the six months of the 1968-69 (ending September, 1968) due to reception of trains on occupied lines separately on trunk routes, main lines and branch lines and at large stations and big junctions and wayside stations and small junctions. The results of the study are indicated below—

Trunk routes

(a) *Big junctions and large stations*—

(i) Number of collisions per 100 big junctions and large stations ..	3·9
(ii) Number of persons killed None	
(iii) Number of persons injured 2	
(iv) Loss in rupees per collision Rs.7,792	

(b) *Wayside stations and small junctions*—

(i) Number of collisions per 100 wayside stations and small junctions 0·36	
(ii) Number of collisions per 100 such stations on the run through lines 0·24	
(iii) Number of collisions per 200 such stations on lines other than the run through lines 0·12	
(iv) Consequences of collisions on run through lines—	
(1) Number of persons killed 7	
(2) Number of persons injured 56	
(3) Loss in rupees per collision Rs.97,038	
(v) Consequences of collisions on lines other than run through lines—	
(1) Number of persons killed None	
(2) Number of persons injured 8	
(3) Loss in rupees per collision Rs.11,604	

Main Line routes

(a) *Big junctions and large stations*—

(i) Number of collisions per 100 big junctions and large stations ..	1·4
(ii) Number of persons killed None	
(iii) Number of persons injured 1	
(iv) Loss in rupees per collision Rs.12,750	

(b) *Wayside stations and small junctions*—

(i) Number of collisions per 100 wayside stations and small junctions ..	0·25
(ii) Number of collisions per 100 such stations on the run through lines 0·17	
(iii) Number of collisions per 100 such stations on lines other than the run through lines 0·08	
(iv) Consequences of collisions on the run through lines—	
(1) Number of persons killed 57	
(2) Number of persons injured 38	
(3) Loss in rupees per collision Rs.270,600	

(v) Consequences of collisions on lines other than the run through lines—

(1) Number of persons killed	None
(2) Number of persons injured	None
(3) Loss in rupees per collision	Rs. 2 210

Branch lines

(a) *Big junctions and large stations*—

Number of collisions	Nil
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(b) *Wayside stations and small junctions*

(i) Number of collisions per 100 wayside stations and small junctions	0·2
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(ii) Number of collisions per 100 such stations on the run through lines	0·1
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(iii) Number of collisions per 100 such stations on lines other than the run through lines	0·1
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(iv) Consequences of collisions on the run through lines—

(1) Number of persons killed	None
(2) Number of persons injured	10
(3) Loss in rupees per collision	Rs. 3,609

(v) Consequences of collisions on lines other than the run through lines—

(1) Number of persons killed	17
(2) Number of persons injured	3
(3) Loss in rupees per collision	Rs. 35,028

346. The study brings out the followings—

- (i) The frequency of collisions at stations on trunk routes is higher than at stations on main lines and branch lines.
- (ii) An identical pattern is revealed in the frequency of collisions and the consequences flowing from them on both the trunk routes and main lines, namely, that
 - (a) the incidence is higher at big junctions and large stations than that at wayside stations and small junctions;
 - (b) the consequences of collisions at big junctions and large stations are less serious than those occurring at wayside stations and small junctions;
 - (c) the incidence of collisions at wayside stations and small junctions is higher on the run through lines than that on the lines other than run through lines;
 - (d) the collisions occurring on the run through lines result in more disastrous consequences than those occurring on lines other than the run through lines.
- (iii) On the branch lines, the consequences resulting from collisions are generally speaking serious. It may be remarked that on branch lines the trains generally stop at all stations. The line—whether run through or loop—on which a collision occurs is, therefore, not of much significance. The consequences of collisions at stations on the branch lines can be serious because wooden bodied and non-antitelescopic coaches are commonly in use.

347. Based on this study we would suggest for the consideration of the Railway Board the following guidelines and targets in respect of provision of track circuiting—

- (i) First priority should be given to run through lines at wayside stations on the trunk routes and to all passenger lines at important junctions on both the trunk routes and the main lines. This work should be completed during a period of four years.
- (ii) Thereafter run through lines at stations on main line routes and all passenger lines at stations on trunk routes should be track circuited. This should be accomplished in a further period of four years.
- (iii) In the last phase, all passenger lines at stations on main line routes and at important junctions on branch lines should be taken up for track circuiting. This work should be completed in another two years.

348. In other words the aim should be to track circuit all passenger lines and run through lines on trunk and main line routes and also at important junctions on branch lines within 10 years.

349. *Track circuits to extend to block clearance points*—At present, track circuiting on run through lines at stations is provided between foulings marks only. While this no doubt reduces dependence on the human element insofar as clearance of the line between foulings marks is to be ensured, it does not guarantee that the line is clear beyond the foulings mark. Should a train or a vehicle be standing beyond the foulings mark, or on an adjacent track foulings the reception line track circuiting as existing at present is unable to prevent a collision.

350. It will be recalled that in the years 1963-64 to 1967-68, out of a total of 207 collisions, 32, that is about 16 per cent, occurred due to foulings marks not being clear. Such side collisions can often be disastrous. Track circuiting must, therefore, in our view, cater for such contingency. We realise that this would mean considerable additional circuitry on either side but when subsequently passenger lines other than the run through lines are track circuited the cost would be correspondingly reduced. In our view, therefore, for track circuiting works of run through lines in progress at present as well as programmed for the future, the policy should be to track circuit the lines between block clearance points. As for the run through lines which have already been track circuited between foulings marks, the work of track circuiting between block clearance points should be taken up as soon as possible.

351. *Failure of track circuits*—The efficient working of all modern signalling installations like route relay interlocking, track circuiting in station yards, automatic block system and centralised traffic control depends to a large extent on the efficient maintenance of track circuits. For this it is important that the materials used in the installations are reliable and durable and the staff who handle them have the requisite training and knowhow.

352. The evidence tendered before us shows that a large percentage of track circuit failures on the Railways is due to—

- (a) activities of miscreants who cut bond wires and track circuit leads;
- (b) theft of materials like batteries, relays, etc;

- (c) poor quality of materials like rectifiers and batteries; and
- (d) failure of insulated rail joints.

353. The most important component of a track circuit is the insulated rail joint. A good insulated rail joint should be non-hygroscopic, provide satisfactory insulation between the two rails and should withstand wear and tear under traffic conditions. At present the joints in use are (a) planed steel fish plates with insulating channels, bushes and end posts made of vulcanised fibre or nylon, (b) fish plates made of compregnated wood known as *Permal* fish plates.

354. In reply to a questionnaire which we had addressed to them, the RDSO stated that the use of nylon as insulating material had, on investigation, been found satisfactory in avoiding failure of track circuits due to crushing of insulated joints. The use of nylon as insulating material and of nylon bushes had been recommended since the incidence of failures in track circuited lay-outs with joints using vulcanised fibre insulation was inordinately high. The Railways have been progressively adopting the use of nylon as insulating material.

355. During our discussion with the Railway Board we were informed that nylon insulation was giving good service and lasted for about six months. The deterioration caused by weather conditions was comparatively less.

356. *Permal* fish-plates—*Permal* fish plates are made of laminated compressed wood. The insulation between rail ends is provided by the end post at the rail expansion gap. These have been approved for use in track circuits at speeds not exceeding 16 km. p.h. Originally, such fish plates were imported. These were in use for a long time on the Central Railway. We were told that they withstood heavy stresses at high speed and that the average life was five years. The Chief Signal and Telecommunication Engineer of a Railway stated before us that from the electrical point of view, a *Permal* fish plated joint is completely foolproof and such a joint has been successfully used in the United Kingdom and on the Continent on high speed routes. He was of the view that *Permal* fish plates were superior to any other type of insulated rail joint. Another Chief Signal and Telecommunication Engineer, however, expressed the view that *Permal* fish plates manufactured indigenously lasted for less than a year and were not entirely satisfactory. The permanent way engineers on their part do not favour *Permal* fish plates for use on high speed routes.

357. During our discussions with the Railway Board, we found that the use of *Permal* fish plates had been allowed on other than high speed lines since the Track Standards Committee had not approved of their use on faster routes. We were told that these were also being tried on a section on the metre gauge and a decision will be taken on the basis of results.

358. The reasons for the decision to discontinue the use of *Permal* fish plates on high speed routes, which was apparently taken on the recommendation made in the 35th Report of the Track Standards Committee in 1958, are not clear to us. We understand that M/s *Permal* of the United Kingdom have since developed improved types of impregnated wooden fish plates and their counterparts in India would be in a position to manufacture fish plates of an improved quality. We suggest that the Railway Board should reconsider this matter in the light of the reported improvement in the design and strength of *Permal* fish plates for use as insulated rail joints on track circuited sections for high speeds.

Automatic Train Control

359. We made an analytical study of collisions and derailments caused by drivers passing signals at danger and the consequences flowing from such accidents for a period of a year and a half, i.e. the year 1967-68 and the first six months of 1968-69. The results of the analysis are summarised below—

S. No.	Nature of line	Collisions					Derailments					(Figures of Rs. in thousands)	
		Num- ber of colli- sions	Casualties		Loss in Rs.	Num- ber of de- rai- l- ments	Casualties		Loss in Rs.				
			Kil- led	Inju- red			Kil- led	In- jured					
<i>Broad gauge</i>													
1. Trunk routes	..	15	46	151	2,370·19	39	1	10		433·34			
2. Main lines	..	2	1	31	0·25	8	..	2		7·68			
3. Branch lines	..	5	1	57	1,375·40	13	65	84		1,288·70			
<i>Metre gauge</i>													
1. Trunk routes	..	4	..	108	118·71	12	..	..		211·20		
2. Main lines	..	1	..	..	2·00	3	..	3		183·88		
3. Branch lines	..	1	1	13	27·75	2	..	..		1·53		

360. It is clear from the figures tabulated above that a substantial number of collisions and derailments took place due to the drivers' failures. Furthermore, a majority of such accidents have taken place on the trunk routes where the speeds are high and trains run through most of the stations.

361. Even the best signalling system would be futile if a driver disregards a signal showing danger aspect. The only reliable method of ensuring against the drivers' failures to observe and obey signals in time is the automatic train control or ATC in short. The system is so designed that a driver receives an audio-visual warning in his cab in regard to the aspect of the stop signal that he is approaching and should he pass the signal at danger, automatic application of brakes takes place. This is made possible by the installation of two separate devices, one on the track which is governed by the signal ahead and the other on the locomotive which the track device activates and sets into operation according to the aspect of the signal. ATC, thus, on the one hand assists the driver in the proper observation of the signals and on the other guards against the possibility of an accident which may arise from failure of the driver in this respect by automatic application of brakes.

362. We remarked in Part I of our Report that we had been advised that the installation of ATC on the Howrah-Gaya-Mughalsarai section was expected to be completed in stages by March, 1970, and that ATC installation was also planned for suburban sections in Calcutta and Bombay areas to be followed by other routes. The Works Programme for 1969-70 does not seem to confirm that the work on the Howrah-Gaya-Mughalsarai section would be completed by March, 1970. Nor does it show that the work in the Bombay area is yet planned. During our discussions with the Railway

Board, we were told that the work is in hand and that the system would cover the Rajdhani Express and the mail and express trains running over the section. It was stated in these discussions that the results of the system would be watched and that a decision about the expansion of the system would be taken based on the experience gained. In these discussions, the Railway Board conceded that the system would have to cover goods trains also if high standards of safety are to be attained.

363. We might add that during our tours, while discussing the subject with railway officers, we observed a certain diffidence and mental reservation among some of them that the provision of ATC might generate a sense of complacency in the minds of drivers and this coupled with the possible pilferage of track equipment may ultimately result in a lower degree of safety in train running. We consider this misgiving ill-founded as ATC is not to be considered as a device aimed merely at making up for lack of vigilance on a driver's part but rather as a check on his alertness. Should the driver fail to act on the restrictive aspect of a signal, the device comes into operation but for each lapse on his part the driver becomes accountable. Furthermore, ATC is already in extensive use on railways in advanced countries and as far as we know, it has not been the experience of any country that because of ATC the locomotive driver has grown careless. As for the possibility of pilferage, we are told that the type of equipment used is such that it has little monetary value to invite pilferage. Besides, were the track equipment to be stolen or interfered with, the system being provided on the Howrah-Mughalsarai section is such that the driver on approaching a signal at 'off' (i.e. Proceed aspect) would not get a bell-warning when he ought to get one and the absence of the bell-warning at the signal would indicate to him that something is amiss and that he must report at the next station for early rectification. It would only be in the contingency when the ground equipment is missing and the related signal is showing danger aspect that the driver would not get the hooter-warning. As stated earlier, the system as visualised rendering as it does the driver accountable each time he fails to respond to the ATC warning, should keep him alert and attentive and an alert driver would no doubt take care of such contingencies.

364. In their replies to the questionnaire which we had addressed, some of the Railways expressed the view that ATC should be provided on routes with speeds higher than 100 km. p.h. Others advocated installation of ATC at higher speeds. There was, however, a general consensus of opinion that ATC should cover all trains and not merely mail and express trains.

365. On the British Railways, ATC is provided on lines on which speeds of 75 miles per hour (120 km. p.h.) and above are permissible and where there is a substantial number of express passenger services as well as on lines having dense suburban passenger service. In the United States, the regulations of the Inter-State Commission forbid speeds in excess of 80 miles per hour (130 km. p.h.) unless ATC is provided. In Germany, ATC is provided on sections with speeds higher than 100 km. p.h. On the Japanese National Railways, the entire system has ATC.

366. We feel that provision of ATC is a matter on which there should be little diversity of opinion. As a means to prevent accidents, it is only second, if even second, in importance to track circuiting. In such matters, however, we cannot go by the criteria adopted by the British and the American Railways since what may be medium speeds in their thinking are high speeds for us. We consider that the lines on which speeds of 100 km. p.h. or over are permitted should be provided with ATC and should

cover all trains including goods trains running on the section. A scheme of priorities should be worked out for the trunk routes. Furthermore, in the light of increasing train speeds and intensity of train services, particularly after the introduction of fast trains like the Rajdhani Express, provision of ATC has become a matter of necessity. We are conscious that owing to financial considerations, the installation of ATC would have to be proceeded with on a phased basis but the phasing too must be done with a sense of urgency.

367. It was indicated by a senior signal engineer during his evidence before us that the estimated cost for providing ATC for the first stop signal only on the six trunk routes, namely, Delhi-Howrah, Delhi-Bombay, Bombay-Madras, Madras-Howrah, Bombay-Howrah and Delhi-Madras and covering all mail, express, passenger and goods trains running on these sections would be approximately Rs. 17 crores. We consider that finding funds of this order should not present any serious problem for the Railway administrations.

368. *ATC on automatic signalling sections*—We would like to observe here that some disastrous collisions have occurred recently on the automatic signalling sections due to the failures of drivers in not having observed the rules for passing the automatic signal at danger. Obviously, provision of conventional ATC would not be able to eliminate the risk of such collisions on sections equipped with automatic signalling since according to rules a driver is authorised to pass an automatic signal showing red aspect on observing certain conditions. We have been given to understand that the ATC equipment being installed in the suburban sections in Howrah area caters for this contingency. When a driver passes an automatic signal at danger, he must keep the speed of the train below 15 km. p.h. upto the next automatic signal failing which a warning is sounded for five seconds and thereafter automatic application of brakes takes place. We consider that this type of ATC should be extended to other automatic sections in Bombay, Calcutta and Madras areas.

369. *Cab Signalling*—On sections where high speed trains run, the locomotive driver is under continuous strain trying to locate and interpret the aspects displayed by the signals. We have been given to understand that on such sections coded track circuits enable a continuous indication to be given in the cab of the locomotive of the state of the line ahead and braking can also be brought into action by the same means. This type of cab signalling enables the driver to run the train with confidence and speed. We feel that it is high time to undertake research and development in regard to continuous cab signalling, however elaborate or expensive this may be so that a greater degree of immunity from accidents can be achieved on such sections. This would also be useful on sections where the visibility of signals is not altogether satisfactory.

370. *Manufacture of electrical signalling equipment*—The Kunzru Committee had strongly urged the establishment of a central signalling workshop by the Railways for the manufacture of electrical signalling equipment. On this recommendation, however, the Railway Board had stated that the setting up of a signalling workshop was unnecessary as two private firms in this field, had assured the Railway Board that they would be developing adequate capacity for the manufacture of sophisticated signalling equipment required by the Indian Railways. The Railway Board had said that signalling technology was developing so fast that by the time the manufacture of electrical signalling equipment could start in a railway workshop, electronic signalling might well come into use.

371. For items for which the Railways depend on the private sector for supply, the effort should be to encourage more than one reliable source so that not only are the benefits of competition obtained, but an eventualty does not arise where the Railway administration may be left high and dry. We were told that in countries like Germany, Japan and France, two or three firms of repute who are prepared to invest money in research and development and who have adequate quality control are given assured orders for manufacture of sophisticated signalling equipment. We suggest that the Railway Board develop their thinking along these lines.

372. As for the supply of conventional signalling equipment, the evidence tendered before us showed that even though such equipment is indigenously manufactured, qualitatively it has not come up to the required standard. This is primarily because certain firms who have neither the resources nor the capacity to manufacture signalling equipment succeed in getting the orders for equipment. Here too, we would like to observe that the Railway administrations would be well advised to give orders to two or three selected firms of repute so that these firms get interested in maintaining the requisite standards in the manufacture of equipment.

Maintenance and inspection of signalling equipment

373. *Maintenance*—The proper maintenance of signalling equipment, like maintenance of any other type of asset, depends on an adequate supply of spares and tools of proper quality, adequately trained staff and also adequate time in which to do the job. We have already dealt with the question of recruitment and training of maintainers and other signalling staff. In a subsequent chapter we deal with the shortage and poor quality of spares and tools. As for the availability of time and opportunity for maintenance of signalling gear under traffic conditions, we would like to observe that during our tours of Railways we received several complaints that the signalling staff are unable to undertake repairs to the signalling gear at the required time due to the non-acceptance of disconnection notices by the operating staff. We were told that often when disconnection notices were presented to the operating staff for disconnecting the gear for maintenance purposes, such notices were not accepted on the plea of heavy train work and the possibility of detentions of trains. An elaborate procedure has to be followed for the safe passage of trains whenever signalling gear is disconnected. The transportation staff are therefore inclined to defer the matter to the extent they can in their anxiety to pass the trains. On the other hand, several of the signalling staff who tendered evidence before us stated that a substantial number of failures of signalling equipment was because of their inability to give their attention to the signalling gear due to this factor.

374. We attach great importance to this matter as we feel that the signalling staff would be apt to resort to short-cut methods for maintenance of signalling gear unless they get blocks of time in which to maintain the gear. The problem assumes great importance at busy stations where the signalling gear is relatively more intricate and needs intensive maintenance. We, therefore, suggest that the whole problem of maintenance of signalling gear should be thoroughly examined and a practicable and safe procedure evolved so that the necessary 'time blocks' are available for the maintenance of signalling gear without much difficulty. Provision for this should in our opinion be made at the time the time-table of a section is being made. If the train time-table makes adequate provision for such maintenance blocks this would not only facilitate maintenance of signalling gear

but would also allow for mechanised track maintenance a reference to which we have made elsewhere and where too we were told difficulty is experienced in making available time blocks. By making provision in the train time-table for an integrated maintenance programme, the maintenance not only of signalling gear but also of track by automotive machines wherever in use and of other overhead installations at stations and on sections could, with advantage, be undertaken in a coordinated manner. We understand that the Railway Board have already sent out a directive that in planning for the development of capacity on trunk routes the sectional capacity should be worked out on the basis of 20 hours of train running in a day so that the remaining four hours can be set apart for maintenance. We commend this step as one in the right direction and reflecting considerable foresight.

375. *Inspection*—The Indian Railways Signal Engineering Manual specifies that the signalling equipment at stations or in block cabins should be inspected once in two weeks by each maintainer and that all gear within the charge of an inspector or an assistant inspector should be inspected once every month. Where there are one or more assistant inspectors posted under one inspector, the provisions in the Manual lay down that the gear at each station in the charge of an inspector should be inspected by him at least once in three months. It is also prescribed that the Divisional Signal and Telecommunication Engineer/Assistant Signal and Telecommunication Engineer must inspect and test all signalling equipment under his charge at least once in 12 months.

376. These provisions have been in the Manual ever since it was first published and when on most of the divisions, Assistant Signal and Telecommunication Engineers were posted as the divisional signalling officers. Since then the traffic density on several sections has increased considerably. There has also been rationalisation in the jurisdiction of the inspectors whose charges are now more concentrated. In course of time, with the large-scale additions in and modifications to signalling installations, Divisional Signal and Telecommunication Engineers have been posted on most of the divisions and are assisted by one or more Assistant Signal and Telecommunication Engineers. We, therefore, consider that the inspections of signalling gear should be intensified and the periodicity of testing of signalling gear should be suitably modified.

377. *Joint inspections of signals*—According to the procedure in vogue, the signal inspector, the loco inspector and the transportation inspector of the section are required to inspect and check the visibility of signals travelling over the footplate of a locomotive once a month jointly. From the information available with us, a record of their inspection is sent to the divisional office for follow-up action on the results of their joint inspection. No record of their observations is however available at the station the signals of which were found having poor or impaired visibility during such joint inspections. We suggest that a copy of the relevant inspection notes may be sent to the station for the reference and facility of inspecting officers visiting the station to enable them to see if the defects and deficiencies pointed out in the joint inspection have been rectified.

378. *Inadequate telecommunication*—During the course of our tours on the Railways and in the evidence tendered before us complaints were made in regard to the frequent interruption of communications on the control lines affecting train operation seriously. Thefts of copper wire and adverse weather conditions were the reasons given for such interruption.

379. We had made a reference to the Railway Board asking them to indicate the extent of interruption to control communications due to theft of copper wire as also the action taken to offset the factors responsible for the low efficiency of control circuits. In regard to the extent of interruption to control communications due to copper wire thefts, we were advised that some sections of the Northern, the North Eastern and the Eastern Railways are the worst affected. On the Northern Railway alone, during the three months from October to December, 1968, the control circuit hours lost due to copper wire thefts exceeded ten thousand. The position railwaywise is indicated in Annexure VI and makes dismal reading.

380. As to the action taken to combat the situation, the Railway Board stated in reply that a system of radio-patching in conjunction with multi-channel VHF (very high frequency) and micro-wave system is being used in order to improve the efficiency of the control lines and to overcome the difficulties created by the interruption of control circuits. In addition, we were given to understand that the Railways had decided to run and man their own line wires instead of depending on the Post and Telegraphs Department.

381. We consider these steps to be in the right direction and hope that these would produce the desired results. We also note with satisfaction that Rs. 16 crores have been allocated for development of telecommunication works on the Railways during the Fourth Five-Year Plan as compared to Rs. 6.23 crores made available during the Third Five-Year Plan and the three years from 1966-67 to 1968-69. We hope that soon the Railways will be able to develop telecommunication facilities on their system commensurate with developments in other fields as we consider that the fullest use of the assets which the Railways have developed in recent years and are developing can be made only if adequate telecommunications are available. Moreover, adequate telecommunication facilities are indispensable for proper supervision and maintenance of two-way communication between the management and the staff the importance of which we have already stressed in Chapter II.

382. *The financial angle in modern signalling*—We have already, in the opening portions of this chapter, referred to the role of signalling and the inadequate attention that it has received thus far. When making out a case for any project from a financial angle, it is difficult enough to make a convincing justification in particular cases, but when it comes to presenting a general case it can well-nigh become impossible unless an integrated and broad view of the matter is taken. Signalling improvements by themselves would always appear unnecessary sophistry unless they are visualised as a part of the scheme to enhance safety and operational efficiency. We have already referred to the costs of accidents—direct and indirect—in the opening paragraphs of the Report and stated that a good part of these is not capable of being reckoned. Nonetheless, to these costs, the Railway administration is subjected from time to time and these must be taken into account when rendering financial justification for signalling and other safety works. To that extent, the present day concept of financial viability of investment needs to be modified particularly in respect of signalling projects. In our view, it would be impossible to attain a high standard of safety, efficiency and economy in working if those responsible for sanctioning the introduction of improved signalling methods, through ignorance or otherwise, fail to realise the true potentialities of modern signalling and continue to apply the conventional yardsticks of financial justifiability to safety works.

CHAPTER IX

MOTIVE POWER

Steam Locomotive Sheds

383. Even though diesel and electric locomotives are being harnessed in the service of the Railways in a big way, there are many thousands of steam locomotives still in service and are likely to remain so for a long time to come. In age, these assets are relatively older and therefore their proper maintenance becomes all the more important to keep them at a reasonable level of efficiency.

384. *Examination and maintenance of steam locomotives*—Every steam locomotive is assigned to a running shed for maintenance purposes. The roster of a steam locomotive must provide for an adequate interval in the shed for examination and servicing of the locomotive. It is during such stop-overs in the shed between the trips that 'running repairs' to a locomotive are carried out. In addition, at regular intervals, each locomotive is given a "standard maintenance schedule" and maintenance overhaul in the shed to keep it in good fettle. It is only for major repairs and for periodical overhaul that a locomotive is withdrawn from service and consigned to the workshop.

385. *Booking of repairs on locomotives*—The maintenance of a locomotive depends primarily on the care with which repairs needed by the locomotive are booked by the driver on return from a trip and by the examining fitter at the incoming inspection pit who is responsible for checking and testing each locomotive on arrival in the shed along with the incoming driver. The examining fitter must see not only that the repairs booked by the driver are correctly and properly indicated, but if any repairs are not booked by the driver, they are duly recorded. Unless the repairs required are booked carefully, correctly and completely, it is not possible to ensure that the locomotive would leave the shed on its next trip in perfect fettle. As a result of the impression we gathered during our visits to some of the locomotive sheds, we would strongly recommend that the examining fitters at the incoming pit are chosen carefully after testing them in their proficiency and ability to read and write. Furthermore, booking of repairs by the driver and the examining fitter must be spot-checked from time to time by visiting mechanical engineers, inspectors and other supervisors. The visiting officers should take the opportunity of their visits to educate the examining fitters in the accurate booking of repairs. The loco foreman too should, in our opinion, be in a position to make spot-checks at least twice or thrice a week.

386. *Equipment at the incoming inspection pit*—Apart from the care which the examining fitter at the incoming inspection pit must take in booking the repairs, it is essential that proper facilities for checking the condition of the locomotive and in particular its undergear are available at the incoming inspection pit in every shed. Such facilities include proper lighting, portable electric lamps and side lights in the inspection pit; proper drainage of the inspection pit and its upkeep and cleanliness, the required

tools, vacuum test disc etc. We received a number of complaints about inadequate lighting and poor drainage in the various sheds. As against this, in a few sheds it was refreshing to find clean and dry inspection pits with adequate lighting. We suggest that whenever officers of the mechanical department inspect the incoming inspection pits, they must in particular check up deficiencies in respect of lighting, drainage, cleanliness, availability of tools etc. The action required to be taken on the observations made by them must be followed up.

387. Execution of repairs—The repairs to an incoming engine having been recorded, it is equally essential that they are carried out thoroughly. The carrying out of repairs properly depends on the availability of proper stores, parts, tools and equipment and also the workmanship of the maintenance staff and the time available for maintenance. We have already stressed the need for proper training of maintenance staff like artisans etc., in an earlier chapter. As for stores, parts and tools, we deal with the question of their shortage and inferior quality elsewhere in this Report. Here, we would like to stress the importance of test checks on the quality of repairs carried out. At present, the fitter in charge in a loco shed, who is also known as the senior chargeman or the loco fitting inspector on some Railways, carries out sample checks on the work done by staff. Considering the way in which bookings are repeated in successive trips, it is obvious that the check on the work done by the repairing staff leaves much to be desired. The National Federation of Indian Railwaymen had, in a memorandum submitted to us, stated that the time allowed for maintenance of engines in the loco sheds is inadequate and that drivers are often forced to work the trains with ill-maintained locomotives. Even though in their evidence, the drivers did not make a complaint of this nature, we have little doubt that the check on the working of the repairing staff in a shed is not altogether thorough. In Part I of our Report, we had pointed out that during the five years 1963-64 to 1967-68, a substantial number of engine failures—38 per cent on the broad gauge and 43 per cent on the metre gauge—were found to be due to bad workmanship in the loco sheds. The fact of this poor workmanship finds further support from the incidence of repeated bookings to which we would refer in subsequent paragraphs. We find that generally a driver examines the engine at the outgoing inspection pit before taking it out of the shed. Whenever he notices any deficiencies he merely points this out to the fitting staff who rectify them there and then with the result that no record of such defects is kept. We would recommend that test-checks at the outgoing inspection pit should be intensified. A general toning up of supervision and inspection would in our view go a long way in improving the standard of repairs and maintenance.

388. 'Repeated Bookings' register—A repeated bookings register is maintained in each shed. This is posted from the repairs which are repeatedly booked by the drivers and the examining fitter at the incoming inspection pit. The entries of repeated bookings in the register are meant to highlight weak points in the design of components in different types of locomotives and the quality of material used so that effective measures could be taken to effect improvement. The register also affords an indication of the standard of workmanship and shows where and in which direction improvement is required. For this purpose, repairs booked repeatedly are required to be carefully analysed, then causes diagnosed and remedial measures taken as necessary.

389. The Kunzru Committee had recommended that the repeated bookings register should be maintained on a uniform basis. The Railway Board had advised us that although they had not issued any standardised form in which the repeated bookings register should be maintained by all the Railways, they had issued instructions indicating broadly the manner in which the repeated bookings register was to be maintained and the manner in which the follow-up action was to be taken. Based on these instructions each Railway had, according to the Railway Board, standardised the form in which a record of repeated bookings was being maintained. We have our doubts whether the understanding of repeated bookings is uniform on all the Railways. For instance, the Eastern Railway has indicated that 'a booking is considered repeated only when the repair is booked for three consecutive times at the home station'. The Northern Railway considers that 'any booking of repairs of items specified in the repeated bookings form for three times or more between schedules in which they are normally attended to will form items of repeated booking'. In addition, the Northern Railway has also included 'protective bookings' in the figures of repeated bookings. We consider it important that there should be no disparity in the concept of repeated bookings on the different Railways. The definition of repeated bookings should be standardised. It would also, in our view, be useful if the form of the repeated bookings register is standardised for use on all the Railways instead of each Railway following its own system.

390. We had asked the Railways to furnish information about repairs booked repeatedly in respect of certain components of steam locomotives for the months January to March, 1969, along with an analysis of such bookings under certain broad causes. For the purpose of this study, we selected twelve such components as find mention in the repeated bookings registers of most of the Railways. The Southern, the South Central, the South Eastern, the Eastern and the Northern Railways furnished this information. The other Railways did not furnish the required information. The study, even though it pertains to only a few Railways and a limited period, is fairly representative and highlights a high incidence of repeated bookings in respect of repairs to certain components as for example piston glands blowing, defective injectors, coupled boxes knocking or hot, little-end knocking or hot, big-end knocking or hot, regulator glands blowing, vacuum brake defective, defective lubricator, etc. In the information as furnished by the Railways, poor workmanship in sheds and shortage or inferior quality of material were shown as the chief causes of repeated bookings. Mismanagement on the part of the engine crew was also responsible to some extent for giving rise to repeated bookings.

391. The defects in a locomotive, apart, in some cases, from being a hazard to safety, distract the driver and disturb the unceasing vigilance which he is called upon to exercise on the state of the track ahead. A case of a repeated booking is, in the first place, a reflection of poor workmanship. But more than that, it can be frustrating and upsetting for a driver who may have taken care to book the repair but who on his subsequent trip finds that the defect has not been attended to or has been attended to improperly. It is true that a locomotive has several thousand different parts. Even so, the limited survey which we have made in respect of repeated bookings shows that there is slackness in the sheds in attending to booked repairs and that there is considerable scope for improvement.

392. We were told during the course of evidence that on the old M.S.M. Railway, a book codifying repairs to a locomotive and highlighting repeated bookings was submitted every month to the Chief Mechanical Engineer personally who would go through the book and deal with repeated defects. This, we were told, contributed greatly to a high standard of maintenance of locomotives on that Railway. We consider that it would be a salutary step if data in regard to repairs booked repeatedly in respect of certain selected components of a locomotive are sent by the Divisional Mechanical Engineer periodically for the attention of the Chief Mechanical Engineer himself. We have no doubt that such a step would result in greater care being bestowed on the maintenance of locomotives.

393. *Defects resulting in unsafe conditions*—We had, in Part I of our Report, analysed the causes of derailments during the five years from 1963-64 to 1967-68 and had shown that 4 per cent of the derailments on the broad gauge and 9 per cent on the metre gauge were attributable to locomotive defects. The two main defects responsible for derailments, as shown in the analysis, were defective wheels or tyres and broken axles or journals. We deal with these defects in the paragraphs which follow.

394. *Defective wheels or tyres*—During the standard schedules of maintenance, namely, schedules II, III and IV, and the maintenance overhaul, the wheels and tyres of a locomotive are checked and the exact wear is recorded in a register. The intention of checking and recording the wear is to make an accurate assessment whether the tyre would not reach the condemning size while in operation until the next check becomes due. The fact that derailments take place due to defective wheels and tyres lends some weight to the assumption that checking and recording of the wear on the tyres is not always done with due care. We would emphasise that greater attention should be paid to the gauging of wheels and tyre profiles.

395. The tyre profiles are machined in loco sheds to prolong their life. For this purpose, every major shed is required to be equipped with a wheel lathe. The North Eastern Railway stated in reply to our questionnaire that not all the major loco sheds on its system have been equipped with these lathes. On the Northeast Frontier Railway also, it came out in evidence that wheels had to be sent to the Dibrugarh workshop resulting in considerable delays. Even while spare wheel sets are normally available in the wheel park for replacement of worn wheels, we suggest that the requirements of loco sheds for provision of wheel lathes should be speedily assessed and such wheel lathes should be provided wherever justified without any loss of time.

396. *Broken axles or journals*—It will be recalled that out of 318 derailments caused by engine defects during the five years 1963-64 to 1967-68, 31 were due to broken axles. The importance of proper and thorough examination of axles and journals therefore needs no emphasis. In accordance with the maintenance schedules, axles or journals are to be examined during schedule IV. This schedule, depending on the type of locomotive, falls due after an engine has travelled 17,000 or 20,000 or 30,000 miles. Since schedule IV does not fall due except at fairly long intervals, it is essential that axles or journals are tested scientifically during this schedule so that defects if any—whether on the surface or deep-rooted—are detected. This is possible only if the axles are tested by ultrasonic

testing equipment. The bulk of evidence tendered before us showed that loco sheds in most cases do not have ultrasonic equipment and they make do with chalk testing which is an inadequate and unreliable method. Often, an ultrasonic testing unit is shared between the workshop and the sheds. We do not consider this practice to be efficacious. In our view, it is likely to lead to a diffusion of responsibility and to render the examination ineffective both in the sheds and in the workshops. In our view, ultrasonic testing equipment is an essential requirement of each major locomotive shed. It is also necessary that the intervals at which the axles and journals of locomotives should be ultrasonically tested in the loco shed should be laid down. We have been advised that action is being taken by the Railway Board to procure additional ultrasonic equipment.

397. Handling of locomotives by drivers—We have already mentioned that the repairs repeatedly booked were on analysis found partly due to mismanagement of the locomotive by the engine crew. It will also be recalled that in Part I of our Report, we had shown that 29 and 26 per cent of the engine failures on the broad and metre gauges respectively during the years 1963-64 to 1967-68 were due to mismanagement of the engine crew. We consider it essential that the training of drivers in the handling of steam locomotives should continue to be pursued with vigour so that steam drivers remain fully accomplished in their basic profession.

398. Standard schedules of maintenance—It is important that each locomotive gets its standard schedule of maintenance thoroughly when it becomes due. On the Northeast Frontier Railway, we found that the programme of schedule repairs was generally getting into arrears. This was attributed partly to the lack of facilities in the loco sheds and partly due to shortage of stores and hand tools. As for shortage of stores and hand tools, we deal with the matter elsewhere. Here we would like to say that we attach great importance to the provision of adequate facilities and equipment like deep drop pits, hoisting arrangements, lighting, machines for repairing or reconditioning of various components, different types of testing equipment, etc., in each loco shed. We would suggest that a detailed survey of the facilities, equipment and machines, etc., available in and required for each loco shed on a Railway should be made by a senior mechanical engineer of the Railway and effective action should be taken thereafter to make good the deficiencies.

399. It is equally important that the schedule repairs to a locomotive, once taken in hand, should be carried out within the prescribed time. **Here too, we found that the Northeast Frontier Railway was getting into arrears.** We are advised that on the Northern Railway, each shed maintains a graph showing the dates on which an engine is due to undergo each of the various schedules, period prescribed for completing the schedule, the date on which a locomotive is taken in hand for schedule repairs and the time actually taken in completing them. This graph indicates at a glance the performance of the loco sheds in respect of the maintenance schedules. Since the system has yielded satisfactory results in keeping a watch on the position of schedule repairs to locomotives, we suggest that its adoption on other Railways be considered with such modifications as local conditions may require.

400. Running performance of a locomotive—The proof of proper attention having been conferred on a locomotive would lie in its performance on the run. At present, apart from what a driver taking out a

locomotive on a journey may observe in regard to its condition, the other checks are only of an *ad hoc* character, being exercised by officers and inspectors while travelling on footplate. While such checks have their utility inasmuch as they enable sampling of the quality of work done in the sheds, they do not cover all the engines systematically. We understand that to overcome this, on some of the Railways like the Central, the Western and the Northern, the various locomotives are assigned to inspectors of the mechanical department individually. An inspector to whom a locomotive is assigned is required to examine it periodically, generally once a month, and to report to the home shed and the Divisional Mechanical Engineer on the condition of its maintenance. He must also ensure that the defects noticed in the locomotive are rectified by the maintenance staff. On the Northern Railway, the appraisal by the inspector of the maintenance of the locomotive which may be rated as 'good', 'fair' or 'bad' is shown on a chart maintained in the loco shed. This system, so to say, is an adaptation of the 'one engine—one crew' system which was in force on the Railways before the pooling or partner-pooling of locomotives started and may be described as "one inspector—a specified number of engines" system. We are disposed to think that such a system, ensuring as it would personalised attention to the locomotives by a nominated inspector would be conducive to better maintenance. Where the condition of a locomotive on inspection by an officer is found to be poor, the inspector to whom it is assigned would be similarly accountable. We suggest that the Railways on which such a system does not exist should examine the merits of this system and adopt it if they consider it advantageous.

Steam Locomotive Workshops

401. *Capacity for periodical overhaul*—With the increasing introduction of diesel and electric traction, the workload in regard to periodical overhaul of steam locomotives in most of the locomotive workshops is being reduced. During the course of our visits to the workshops, we found that most of them had adequate capacity for overhauling of locomotives. The only case where capacity was reported to be falling short of requirements was at the Lalaguda workshop where we were told that the capacity was limited to 7 broad gauge locomotives against the requirement of 18. We were informed that the Southern and the Central Railways were assisting the South Central Railway in the matter of periodical overhaul of steam locomotives. We have no doubt that the South Central Railway has already made an assessment of its requirements of overhaul of steam locomotives and in case the requirement is going to outstrip the capacity, to develop it suitably.

402. *Machines and equipments*—In several workshops which we visited, there were complaints that the machines installed were overaged or obsolete. One Works Manager told us in his evidence that 50 to 60 per cent of the machines in the workshop were overaged and this in turn affected the outturn both qualitatively and quantitatively. In another workshop too, we were told that a number of machines were obsolete and could not function like new machines even after reconditioning. This it was stated, resulted in loss of speed in production as also of precision. While we are aware that the machinery and plant programme is made out every year for replacements and additions, we consider it necessary to emphasise that replacements of worn out machines should be effected as expeditiously as possible.

403. *Testing of springs*—We found during our visits to the workshops that generally springs of locomotives were subjected to load deflection as well as scrag testing to the extent of 100 per cent and that most of the workshops were adequately equipped for the purpose. At the Lalaguda workshop, however, it came out in evidence that scrag testing of springs was being done on load deflection testing machines which is not a scientific method.

404. In Part I of our Report, it has been brought out that about 9 per cent of engine derailments were due to defective or broken springs or suspension. The incidence of such derailments can be brought down only if springs are subjected to proper heat treatment, scrag and load deflection tests. Where workshops are not adequately equipped with modern scrag and load deflection testing machines, they should be so equipped without further loss of time.

405. *Balancing the weight of engines*—For safe and efficient running of a locomotive, proper distribution of weight on the various wheels must be ensured. We found during the course of our visits to workshops that some of them did not have weighbridges for weighing and adjusting the load if required. The weighbridge in the locomotive workshops at Lucknow was not only unsuitable for certain heavier type of engines but had been out of order for a long time. Most of the Deputy Chief Mechanical Engineers emphasised that every workshop must have a weighbridge for proper distribution of weight on all the wheels. We strongly urge that all locomotive workshops should be equipped with proper weighbridges.

406. *Ultrasonic testing equipment*—We have already referred to the need for proper examination of axles. The evidence tendered before us highlighted the inadequacy of ultrasonic testing equipment in the workshops. The Chief Mechanical Engineer of a Railway and some other senior officers of the mechanical department stated before us that the ultrasonic flaw detectors on their Railway were not adequate to test the axles of all locomotives. Some of the workshops which did have the equipment had to share it intermittently with the locomotive running sheds. We would urge strongly that adequate provision should be made in each of the workshops for ultrasonic equipment for the testing of axles. In fact the provision should be such that not only the axles of locomotives but also coaches and wagons can be subjected to ultrasonic testing to a specified extent.

407. *Quality control*—There was considerable evidence to show that the emphasis in the workshops is at present primarily on the quantitative outturn to the detriment of the quality of the job done. A General Manager stated during his evidence that a lot of bad quality work was being done in the workshops because everyone was concerned with the outturn rather than the quality of work done. A retired Additional Member of the Railway Board stated that the efficiency of the officers in charge of the workshops was judged by the quantum rather than by the quality of outturn. Some technical supervisors in a memorandum submitted to us also complained that quality control in the workshops was not sufficiently effective.

408. It was suggested to us that the inspection organisation in the workshops should not be subordinate to the authority answerable for the outturn. In this we were assured by the Deputy Chief Mechanical Engineers and the Works Managers of the different workshops that the inspection organisation was effective and that this wing was headed by

a Production Engineer who was independent of the Works Manager responsible for repairs and output. It may, however, be mentioned that a Production Engineer is under the Deputy Chief Mechanical Engineer who is in overall charge of the workshop. Quality control is not merely a refinement but something vital for safety in train operation. Not only must the inspection organisation in a workshop not be subordinate to the person charged with the responsibility of the outturn but it must be capable of making a thorough inspection at every stage of the work. For an evaluation of the functioning of quality control, we must look at the analysis of failures of the various parts of a locomotive due to poor workmanship in the workshops. We had pointed out in Part I of our Report that about 9 per cent of the total number of engine failures on the broad gauge and about 10 per cent on the metre gauge during the five years 1963-64 to 1967-68 were ascribable to poor workmanship in the workshops. We suggest that a periodic evaluation of the efficacy of quality control in the workshops should be done at the Chief Mechanical Engineers' level. We also emphasise the need for more detailed information being regularly supplied to the workshops concerned in respect of failures of locomotives arising from poor workmanship so that they can adopt proper remedial measures.

409. Headlights and dimmer switches—Often during the course of evidence a chronic shortage of headlight bulbs was pointed out to us. We were told that bulbs got burnt out, the reflectors were of bad quality and the headlights often failed or got dim. We were also told about the difficulties in the maintenance of dimmer switches due to pilferage of copper parts. We consider that with a careful study of the present defects and a few minor improvements in the designs of the reflectors and dimmer switches it should be possible to ensure that locomotives go out with proper headlights and dimmer switches in working order.

Diesel and electric locomotive sheds

410. The standards of maintenance of diesel and electric locomotives are entirely different from those for the maintenance of steam locomotives. These traction assets are far costlier and if maintained in good fettle, can prove far more efficient. The necessity for excellence in servicing, maintenance and repairs of such locomotives therefore needs no emphasis. At the same time, it is essential that the equipment and the facilities for maintenance as also the maintenance practices for such locomotives should be standardised and the standards so prescribed complied with.

411. Diesel locomotives—We had enquired from the Railway Board's office if the machinery and plant to be provided in diesel and electric locomotive sheds had been standardised, and if so, to what extent the standardised equipment had been provided in the sheds. We find from the information furnished by some of the Railways through the Railway Board that the understanding of the various Railways in regard to the standardisation of machinery and plant to be provided in a diesel locomotive shed is not uniform. For instance, one Railway has stated that standardised equipment has not been prescribed for sheds having less than 100 locomotives. Some other Railways have stated that machinery and plant have not been standardised beyond the fact that the Research Designs and Standards Organisation have mentioned certain items of equipment. One Railway went to the extent of saying that the programme of complete acquisition of equipment cannot be fulfilled unless it is standardised.

412. The Railways have, however, stated in reply to our questionnaire that by and large there is no difficulty in procuring the equipment required which is indigenously manufactured. Even so, some have referred to non-provision of certain equipment which the diesel sheds are in need of at present. The Central Railway stated that the Itarsi shed which was originally planned for housing 40 locomotives has to hold 60 at present which creates problems. The Eastern Railway have stated that there is need for modern machines both imported and indigenous and a considerable number of components have to be imported, but the inadequacy of foreign exchange restricts the scope for development. The South Central Railway informed us that they do not have any diesel locomotive running shed on their system and this poses problems. We would urge the Railway Board to standardise the equipment and the facilities required for the diesel loco sheds where they have not so far been standardised so that the Railways can thereafter take steps to equip the sheds to the required standard and the facilities available in diesel sheds can compare favourably with those available for maintaining similar assets in other advanced countries.

413. We might mention here that an indication of the standard of maintenance is given by the fact that as against target of 200,000 kilometres per diesel engine failure as laid down at present, the actual performance on one Railway is of the order of 70 to 80 thousand kilometres. This is a clear pointer to the need for improving maintenance of diesel locomotives.

414. *Electric locomotives*—The picture in regard to the maintenance of electric locomotives as depicted in the figures of electric locomotives failure is more or less the same. During the years 1966-67 to 1968-69, the figures of failures in relation to kilometrage per engine failure on the broad gauge were as follows:—

Gauge	Railway	1966-67		1967-68		1968-69	
		Number of failures	Engine Kms/ engine failures	Number of failures	Engine Kms/ engine failures	Number of failures	Engine Kms/ engine failure
Broad Gauge	Central	90	65,865	700	7,744	637	10,816
	Eastern	135	1,40,980	249	81,908	283	72,473
	Northern	29	65,762	132	31,974	176	38,010
	South						
	Eastern	94	82,602	92	1,08,855	184	70,336

415. It will be seen that the performance of electric locomotives falls well below the target of 200,000 kilometres per engine failure laid down by the Railway Board. One of the Chief Electrical Engineers stated that fire was the biggest single cause of failures and that this was due to the equipment not being kept clean. Another Chief Electrical Engineer ascribed the failures to defects in the main circuit breakers, failure of insulation of relays and contactors sticking due to dust. Great stress was laid on well trained staff, adequately equipped loco sheds and availability of spare parts and stores for the proper maintenance of electric locomotives. It is in this context that we take note of the fact that electric loco sheds have not yet been provided with all the machinery and plant which they should

normally be equipped with. We have scrutinised statements of machinery and plant provided at the electric loco sheds at Tatanagar, Asansol and Kalyan which the Railway Board sent to us and we find that these sheds are deficient in respect of several important items of machines and equipment. The sheds at Bhusaval and Mughalsarai too have not yet been fully equipped. We point this out only to emphasise the need for ensuring that the electric loco sheds are equipped with all the necessary machines and plant from the beginning if maintenance of a high standard is to be attained.

416. A committee of senior officers has, we understand, been appointed to go into the question of standardising the machinery and plant to be provided in electric loco sheds. We consider it a step in the right direction and hope that the committee would accomplish its task so on and that its recommendations will be implemented early. We have been advised that once the machinery and plant are approved as a standard equipment for the loco sheds, no difficulty is anticipated in procuring the machinery and plant indigenously manufactured. For the difficulties encountered in obtaining imported machinery and plant, a solution would have to be found.

417. *Speedometers and speed recording apparatus*—We had recommended in Part I of our Report that all locomotives working trains should be equipped with speedometers on a phased programme and a target should be laid down in regard to the provision of this aid on all locomotives. The Railway Board while accepting this recommendation stated that all diesel and electric main line locomotives had already been fitted with speedometers. They added that all steam locomotives working passenger trains and some working goods trains had also been fitted with speedometers and that the remaining steam locomotives (except those employed on shunting) would be fitted with speedometers on a phased programme.

418. During the course of our tours, it came out in the evidence of a number of officers including some Chief Electrical Engineers, Chief Mechanical Engineers and a General Manager that the VDO type speedometer was meant primarily for road vehicles and was not suitable for locomotives. It was stated that the speedometer was sluggish and did not show accurate speed when decelerating specially in the lower speed range, the indication being higher than the actual speed of the locomotive. The VDO speedometer moreover functioned when the locomotive worked in one direction. This naturally precluded the use of the speedometer on diesel locomotives. We were told that unless a special device was installed between the gear box and the speedometer which would work the spindle in the instrument in the indicating direction when the locomotive was being driven one way or the other, this difficulty could not be overcome. A Chief Electrical Engineer, in a note submitted to us, pointed out that the graph recorded by the VDO type speedometer was a 24-hour graph on circular paper of a small size indicating speed and time and was therefore of limited use in checking the observance of speed restrictions by drivers. We were also told that the flexible shaft and the gear box often gave trouble. Even though the RDSO have suggested various measures to overcome the defects, it was, we were advised, doubtful whether these speedometers would give satisfactory service even with the modification in the gear box and the flexible shaft. It was generally contended that the indigenous development of a Haslar¹ type instrument may provide a solution.

419. We understand that some of the locomotives are at present fitted with the Hasler speedometer-cum-recorder which incorporates the feature of direction corrector. The speed is recorded to a linear scale and the paper roll lasts for 7 days. The speed-time-distance graph indicates the speed at every point on the route. The instrument is reliable and has stood the test of satisfactory service over many years.

420. In our discussions with the Railway Board, we were given to understand that the firm manufacturing the VDO type speedometers were themselves interested in the manufacture of Hasler type instrument in collaboration with a German firm. It was hoped that the terms and conditions of collaboration would be finalised soon and a more suitable type of speedometer would be available. We would urge that energetic steps may be taken to see that a more suitable and reliable type of speedometer-cum-speed recorder may be manufactured indigenously for use on locomotives.

421. We also observed during our tours that a number of diesel locomotives on the metre gauge were fitted with speedometer-cum-recorder below the sill of the look-out panel at the shorthood end. In such a position, the driver has to turn back in an inconvenient position to look at the speedometer when the locomotive is being driven with the longhood leading. In our discussions with the Railway Board, we were given to understand that they were already seized of the problem and were thinking of providing another speedometer for the driver for use when the engine runs with the long-hood leading. We would suggest that either the speedometer should be repositioned on the control desk or alternatively another speedometer may be provided so that the driver can refer to it conveniently.

422. We were also told that in regard to the difficulty that the present speedometer could function only in one direction, the Western Railway had tried out a 'direction corrector' with the VDO type speedometer with successful results. So long as the VDO type speedometers are in use on diesel locomotives, it is suggested that a direction corrector should be fitted.

423. We had already mentioned in Part I of our Report that a substantial percentage of VDO type speedometers were being received by the locomotive workshop at Lucknow for repairs even before a period of 6 months had elapsed. On another Railway, a Chief Electrical Engineer, in a note submitted to us, stated that the incidence of ineffective speedometers was about 70 per cent. We were told that a reserve of 20 per cent speedometers was provided in the sheds so that the defective speedometers could be replaced and sent to the workshops for repairs. We consider that until facilities and the necessary expertise can be built up in locomotive sheds to handle defective speedometers efficiently, it would be a wise policy to replace the ineffective speedometers from reserve stock and send the ineffective units to the workshops for repairs. Simultaneously a detailed technical survey of the defective speedometers and the intervals at which the components require attention in the workshops should be made and on the basis of this survey remedial measures evolved so that a target for servicing of speedometers not other than once a year can be achieved.

424. *Drivers' Vigilance device*—Conditions of work in the driving cab of a diesel or electric locomotive are very different from those in the cab of a steam locomotive. The comfortable seat, the dim light in the cab, the dull purr and the whirring of a locomotive, the staccato click of the rail and the monotony of long run in an enclosed cab, all combine to create

drowsiness in the driver. This therefore raises the question of the need for a constant check on the alertness of the driver in the interest of safety in train running.

425. The simplest device to safeguard against a locomotive running away in the event of the driver falling asleep or getting incapacitated is the deadman's handle or pedal. This consists of a foot-pedal or a push button which must be kept continuously pressed by the driver. In case the pressure on the pedal or the push button is released, the locomotive power gets cut off and the brakes apply automatically. The device, though adequate in normal conditions, is not fool-proof. There have been instances when a driver fell asleep or fainted in a position that pressure continued to be applied over the device thus defeating the purpose of its provision. Moreover, the equipment is susceptible of interference by a driver who may be inclined to avoid the physical strain of keeping the deadman's handle or pedal stressed and may choose to jam it or keep it under pressure artificially.

426. Need is therefore felt for a more effective and fool-proof device. In such a device a driver must make a movement at regular pre-determined intervals. Should he fail to make the required movement after the specified interval, an alarm is sounded in the cab; if, even then no response is made by the driver the power of the locomotive is shut off and the brakes apply automatically. The provision of such a device, which is known as 'Driver's Vigilance Device' has been accepted as a standard equipment by the Railway Board for all diesel and electric locomotives.

427. In reply to a questionnaire sent by us the RDSO stated that different types of vigilance devices used in foreign countries had been tried for obtaining service experience. The different systems tried out were WABCO, Smith Stone and Oerlikon. None of these systems, according to the RDSO, was found entirely satisfactory and reliable under the operating conditions of Indian Railways. It was therefore decided to develop a more suitable indigenous device.

428. Some time ago, a mechanical engineer on the Indian Railways developed a driver's vigilance device which functions on a time cycle basis. In this device there is a foot pedal which the driver must hold in mid-position normally and at specified intervals either depress or release the foot-pedal. Unless he does so, he receives an audio-visual warning and if this too is ignored an automatic cutting off of power and application of brakes takes place. Each time the driver fails to respond to the warning, his failure gets recorded. Another inbuilt feature in the device is a push button switch which isolates the equipment for the duration of a single vigilance-time cycle so that the driver may be able to go to the other side of the cab look for the signals if necessary.

429. We had the opportunity to see the tests being carried out on this device (which has been named as 'Driver's safety control') during our visit to the Lalaguda workshop. Later, we also saw a unit fitted on a WDM locomotive at Bhujaval. It was reported to be functioning satisfactorily. The device, we were advised, had been evolved in two designs—electro-mechanical and electro-pneumatic. We were told that the Railway Board had placed an order for 20 electro-mechanical and an equal number of electro-pneumatic units with a Calcutta firm for trials on broad gauge diesel locomotives.

430. It is indeed gratifying to note that engineers of the Indian Railways have shown such remarkable enterprise in designing devices of a refined type. We hope that the results of trials under operating conditions would be assessed early and improvements as required carried out. We would on our part suggest that within the shortest possible time, all diesel and electric traction units should be equipped with a driver's vigilance device. All new motive power units manufactured at Diesel Locomotive Works and Chittaranjan Locomotive Works should be fitted with this device before being sent out to the Railways.

431. Any reservations that we might have had in our minds in regard to the reaction of drivers to such a device were dispelled in our discussions with Col. D. McMullen who told us that the drivers on the British Railways were taking to the device perfectly well. He added that before installation of the device, the proposition had been put to the unions and discussed with them and that they had accepted the use of the device with a time cycle of about one minute. We would suggest that while the process of installation of the device is continuing, the administration should take steps to carry the staff with them. In our discussions with the Railway Board we were given to understand that a programme for acquainting drivers with the usefulness of this device and for making them realise its utility in the safety of train operation would be drawn up and followed. The Railway Board are hopeful that drivers would understand the value of this device. We too would like to express similar hopes.

432. *Anti-wheel slip device*—Under unfavourable conditions, both at the time of starting and during the run, the wheels of the driving axles rotate and spin without corresponding motion of the locomotive. This is known as wheel-slip. Wheel slips can cause rail burns. The driver's first anxiety while starting a train is to avoid slipping of the wheels.

433. A common device used to guard against wheel slipping is the sanding gear, but this arrangement is effective only if dry and clean sand is available and the sanding gear is kept in working order.

434. Diesel locomotives are more prone to wheel slipping than steam or electric locomotives. On diesel locomotives, slipping of wheels ordinarily occurs when traction motors are working in series combination. Both in the ALCO and the General Motors diesel locomotives, anti wheel-slip devices are provided. On the diesel locomotives manufactured by the General Motors, a warning light in the cab indicates the occurrence of a wheel-slip. In ALCO locomotives, the indication is given by a warning light and a buzzer.

435. The Chief Design Engineer of the Diesel Locomotive Works, Varanasi, in a note submitted to us, stated that in the control system of the diesel locomotive, means are provided to detect and automatically arrest a wheel-slip within a short time. The system makes use of the characteristics of the series traction motors to operate the wheel-slip relays in various types of circuits. The wheel-slip is thus automatically corrected and the power is reapplied when the slipping has stopped.

436. We would recommend that the anti-slip devices be provided on diesel and electric locomotives should be frequently checked for their efficient functioning. We would also suggest that both the indications, i.e., visual as well as audible, should be provided on diesel locomotives to give an indication of wheel-slip. Provision of such devices would, in our view, lead to a substantial reduction in the incidence of rail-burns.

CHAPTER X

GOODS AND COACHING STOCK

437. The Railways operate a large fleet of goods wagons and coaching vehicles. The examination and maintenance of this largest single item of mobile equipment, namely, wagons and coaches has an important bearing upon the standard of safety in railway operation. In Part I of our Report, we had observed that of the total number of derailments during the five years 1963-64 to 1967-68, 21.6 per cent on the broad gauge and 22.3 per cent on the metre gauge were due to carriage and wagon defects. In fact, the incidence of derailments attributable to carriage and wagon defects was the second highest, i.e., next to that due to staff failures. Moreover, of all the derailments due to carriage and wagon defects, 30 per cent on the broad gauge and 32 per cent on the metre gauge were mid-section derailments which are potentially more serious. In consequence, the examination and maintenance of wagons and carriages is a matter deserving the closest consideration.

438. *Examination of goods wagons*—We had in Part I of our Report, stressed the need for the adoption of a uniform basis for fixing the time schedule for train examination and for determining the strength of examining gangs essential for proper examination and repairs of trains. Some of the mechanical engineers who tendered evidence before us stated that the entire question of train examination should be reviewed and work study should be undertaken to assess the adequacy of time allowed for examination of goods trains vis-a-vis the strengths of the examining gangs on the various Railways. The evidence, thus, supported what we had already said in Part I of our Report. The Railway Board have stated in their comments on our suggestion that a uniform time schedule for different types of train examination is being laid down on the basis of which gang strengths in different yards would be determined by the Railways taking into account the number of trains dealt with in these yards. We welcome this decision and hope that its early implementation will remove the complaints voiced by officers and staff about inadequate time allowance for examination, insufficient gang strengths, skipping of repairs, etc.

439. In the course of our tour on the Eastern Railway, we got an opportunity of observing and discussing the system of train examination introduced at Andal. Under this system, the examination of incoming wagons on the reception lines has been intensified and rationalised. Materials in adequate quantities are made available at the site of examination for doing the repairs and the gang strength of each batch attending to different parts of wagons has been fixed after carrying out a work study. The responsibility for the proper examination and repairs of a particular 'gear' of a wagon is entrusted to specific groups of carriage and wagon staff who can be distinguished by their badges so that responsibility can be directly fixed on the specific group should a case of skipping of repairs or poor workmanship be noticed. The various specific groups are earmarked variously for undergear, box feeling, oiling and nursing, buffer and draw gear, springs, axle guard and axle box, and vacuum brake assembly. Portable electric

torch lights worn on the forehead have been provided for proper examination. We were told that this system had resulted in considerable improvement in the condition of goods stock in addition to saving detention to outgoing trains. We were also told that the Andal pattern of train examination has since been introduced in some other yards on the Eastern as well as other Railways. If the system has proved efficient, economical and useful, we see no reason why it should not be extended to other important train examining centres. We suggest that difficulties, if any, in its adoption at other places should be overcome.

440. We received several complaints from the train examining staff at various stations and yards on the zonal Railways that the transportation staff often asked for the examination of a load in less than the prescribed time. It was contended that, at times, only one hour was allowed for intensive examination of a train instead of two hours fifteen minutes as prescribed in the Conference Rules. A Chief Mechanical Engineer pointed out that though the provision in the Conference Rules permitting curtailment of time for train examination was intended to be an exception to be resorted to on rare occasions, its use has become a general practice. We consider that the maintenance of goods rolling stock merits no less importance than yard operation and the occasions on which recourse should be had to the provision for curtailment of time for train examination in exceptional cases should be few and far between.

441. There are different types of train examination to which goods stock is subjected according to requirements. These are termed 'safe to run', 'rejection standard', 'IRCA rejection and debit standard', 'intensive examination', etc., though the IRCA Rules lay down only one standard, namely, the 'rejection and debit standard'. Although some Railways have issued instructions in book-form for the train examining staff, it seems that some confusion still exists in the minds of staff about the distinction between the different types of train examination, and particularly as to 'safe to run' examination. Now that a uniform time schedule for the different types of train examination is being laid down by the Railway Board as stated earlier, we suggest that the scope of each type of train examination given to goods rolling stock should be clearly defined for the guidance of the staff and the components to be examined and checked, spelt out and incorporated in the rules. We have already, in an earlier chapter, suggested preparation of handbooks in simple language for train examiners and some other categories of staff.

442. A General Manager during his evidence before us stated that the incidence of derailments due to carriage and wagon defects was high despite the increasing emphasis on the examination of goods rolling stock. He thought that the existing designs of rolling stock are outdated. This, he went on to say, called for a thorough examination of the design of wagons in respect of undergear fittings, etc. by a technical committee. This of course does not necessarily imply that the existing designs of goods rolling stock are unsafe for the performance for which they were intended. To us, all aspects including examination, maintenance, design etc. have equal importance insofar as there is scope to reduce the incidence of derailments due to carriage and wagon defects. We would like that apart from 'defect investigations' which are being undertaken by the RDSO off and on in respect of components which are reported to fail frequently, the design of goods rolling stock, particularly IRS wagons should be further examined

by the RDSO or by a committee of technical officers to see if there are any inherent defects and if any modifications are necessary in view of the higher speeds being planned.

443. We had noted in Part I of our Report that about one-fourth of the total number of derailments due to carriage and wagon defects are caused by defective or broken springs or suspension, and another about one-half of the derailments on carriage and wagon account are due to broken axles or journals, breakage of undergear, vacuum and brake fittings, defective wheels or tyres, defective or broken axle boxes, binding brake blocks, hot axles, etc. We understand that draw and buffering gear, springs and brake undergear, other running gear, etc., are examined during all types of train examination so that such defects are either rectified on trains or alternatively, wagons are damage-labelled for sicklines. Even in the Andal system which identifies the groups with their specific jobs, it is essential that the groups concerned should be educated in respect of the incidence of derailments caused by the various defects and their consequences in order to provide motivation for a higher standard of workmanship. It is also necessary to provide the essential gadgets for examining the various components and to train the examining staff in their use.

444. *Maintenance of goods wagons*—The repairs on goods wagons are carried out on trains or in traffic yards, in sicklines and in workshops. The scope of maintenance on trains and in traffic yards has been progressively enlarged in order to avoid wagons being put out of commission. One Chief Mechanical Engineer stated during his evidence before us that the carrying out of too many repairs in traffic yards was not a correct policy as the attention paid to wagons could not be of the same standard as that in the sicklines. We fully appreciate the views of the Chief Mechanical Engineer, and think that a satisfactory solution lies in identifying the repairs to be carried out on trains and in traffic yards, standardising the pre-requisites for the proper carrying out of such repairs and then ensuring that the pre-requisites are available.

445. *Sicklines*—The wagons damage-labelled are attended to in sicklines. Some of the sicklines are meant for ordinary repairs but selected sicklines undertake major repairs. It goes without saying that sicklines should have the necessary facilities and machines, tools and plant. Some of the sicklines visited by us during our tours were reported to be deficient in the strength of staff or in some of the facilities or equipment. We understand that on the recommendation of the Standards Advisory Committee, the Railway Board have classified the carriage and wagon depots and sicklines with respect to the equipment and facilities to be provided therein and standardised the repairs to be carried out in each. We consider it important that taking into consideration the nature and extent of repairs to be done, the facilities and equipment in each sickline should be surveyed and the deficiencies made good.

446. All major sicklines need, in particular, to be equipped with wheel lathes, ultrasonic testing equipment and burnishing machines. A hot box is a common phenomenon on the Indian Railways. At present, the axles which run hot have to be sent to carriage and wagon workshops for testing and attention. This results in considerable delays. The provision of wheel lathes, ultrasonic testing equipment and burnishing machines in the major sicklines will enhance the standard of maintenance of rolling stock in the sicklines as axles will be subjected to more scientific examination and attention than is possible with the present method of chalk-testing.

447. We would like to observe here that every wagon, except those fitted with roller bearings, goes to the sickline every six months for normal axle box repacking. This is the occasion when the wagon should receive full attention and be turned out in as perfect a condition as possible with all defects rectified. We are not sure if adequate checks are exercised on the wagons coming out of the sicklines after repacking. These checks should be greatly intensified as, in our view, the standard of repairs given to the wagons would depend on the measure of inspection and supervision conferred at this stage.

448. *Examination and maintenance of coaching rakes*—Coaching stock receives attention in washing and pit lines where it is washed, cleaned and maintained. Passenger carriages are given primary and secondary maintenance in specified carriage and wagon depots. Such maintenance covers all items which affect the personal safety and convenience of passengers as well as safety of the carriages on run. In addition, carriages are given safe to run examination at selected points during the journey of a train.

449. For proper attention on the washing and pit lines to be possible, it is essential that the washing and pit lines are adequate in number, they have proper lighting and drainage arrangements, the necessary equipment for examination and maintenance of carriages is available and the rakes are placed in time by the station staff and are allowed to remain there for an adequate length of time for proper maintenance to be given.

450. In the course of our inspections on the various Railways, from the evidence tendered before us and from the information contained in the brochures given to us, we found that the facilities for the primary and secondary maintenance of rakes were not adequate. We observed, for instance, that the facilities for attention to coaches at Bombay V.T. had not expanded commensurate with the increase in workload; the stabling accommodation at Madras Central was inadequate; the number of pit lines at Ajmer was inadequate resulting in a rake not getting sufficient time for maintenance; there were no washing or pit lines for maintenance of metre gauge coaching stock at Secunderabad, etc. We also found that washing and pit lines being common, the pits remained full of filth and water due to deficient drainage and this prevented proper examination and attention to undergear fittings. Inadequacy of illumination from the hurricane lamps for the examination of undergear fittings of rolling stock was also mentioned. We were told that the rakes had, at times, to be examined on platform lines which precluded a proper examination of the rakes due to the existence of a high level platform on one side and absence of a pit. In this background, we thought it fit to call for data in respect of maintenance of rakes on platform lines (i.e. not placed on washing lines and pit lines) at a few selected points on the Northern Railway, viz., Allahabad, Lucknow, Delhi, New Delhi and Jullundur City for the year 1968-69. The results of this study are shown in the following table:—

Number of rakes required to be placed on washing and pit lines for maintenance	Number of rakes not placed on washing and pit lines	Percentage of rakes not placed on washing and pit lines
23,393	4,068	21·2

451. Though the study is very limited in nature, it is sufficient to highlight the magnitude of the problem and is, in our view, fairly representative. We strongly urge that energetic steps should be taken to ensure the

provision of adequate number of washing and pit lines with the necessary facilities, so that each rake is properly examined and maintained on washing line or pit line. We also consider it necessary that there should be timely placement of rakes on the pitlines to facilitate examination of wheels and undergear.

452. Incidence of damaged coaches due to electrical and mechanical defects—When a coach is unsafe to run or not fit for occupation by passengers due to body or electrical defects, it is marked 'sick' and detached from the rake of which it forms a part. Such sick coaches are ordinarily taken off the rakes for repairs at primary and secondary maintenance centres. If a coach develops defects on the run, it is marked sick and detached at a station en route. The position of coaches marked sick for non-scheduled repairs on the broad and metre gauges during 1967-68 and the first six months of 1968-69, i.e. a period of 18 months, is shown in Annexure VII.

453. When a coach requires attention which cannot be given on the pit or washing line, it is 'damage-labelled' for placement in the sickline where facilities for undertaking repairs are available. In sicklines, coaches are thoroughly examined and repairs carried out as required to ensure their roadworthy condition. Apart from the periodical overhaul which is given to coaches in workshops, scheduled repairs normally include repacking of axle boxes and oiling them at specified intervals. Repairs other than scheduled repairs are termed non-scheduled repairs.

454. We find that the percentage of coaches marked sick and detached for repairs at stations other than the primary or secondary maintenance centres, to the total number of coaches marked sick was 6.2 on broad gauge and 8.1 on metre gauge. Of these, the percentage of coaches marked sick and detached at stations en route alone to the total number of coaches marked sick was 1.9 on the broad gauge and 3.4 on the metre gauge. A coach marked sick en route is not only a source of discomfort and inconvenience to passengers but also a hazard to safety, apart from it causing dislocation of train services. This is a matter which require particular attention of the Railway administrations. We would emphasise that attention to coaches at primary and secondary maintenance centres should be intensified in order to reduce the overall percentage of sick coaches.

455. Coaches marked sick on mechanical account—We also studied the mechanical defects for which carriages were marked sick during 1967-68 and the first six months of 1968-69. The result of our study is given in Annexure VIII. It would be observed that running gear defects, i.e. those relating to axle boxes, bogie frames, spring suspension and brake gear accounted for the highest percentage of the total number of defects on both the broad and the metre gauges. It would be seen that the incidence of damage labelling on this account was higher on certain types of coaches than on others. The percentage of coaches damage-labelled due so wheel defects was also on the high side, particularly in respect of ICF coaches on the broad gauge. Running gear defects and wheel defects accounted for 71 per cent of sick coaches on the broad gauge and 79 per cent on the metre gauge. We mention these percentages with a view to emphasise the need for greater attention to coaches at the maintenance depots. We further suggest that a broad analysis of defects resulting in damage-labelling of

coaches should be made at regular intervals and the concerned acquainted with the results. Such a measure will be helpful in keeping the train examining staff and supervisors on their toes.

456. *Coaches marked sick on electrical account*—It will also be seen from Annexure VII that about 22 per cent of coaches on the broad gauge and about 10 per cent of coaches on the metre gauge were damage-labelled due to electrical defects. The largest percentage of such coaches was those falling under the head 'other coaches' or 'ICF' coaches on both the gauges. While we are not unmindful of the incidence of pilferage of electrical fittings, which often leads to damage-labelling of coaches, we would urge that a detailed analysis of the causes of electrical defects be made and remedial measures taken to minimise the incidence of coaches being marked sick on electrical account on all gauges. We consider that it would be useful if the staff are made aware of the results of this analysis with a view to improving the standard of examination and maintenance of electrical installations in coaches.

457. *Maintenance of electrical fittings in coaches*—Elsewhere in our Report, we have dealt with thefts of electrical fittings and the shortage or inferior quality of electrical stores and spare parts. The need for adequate training of electrical staff has also been dealt with in an earlier chapter. Here we deal with measures to reduce the incidence of fires in coaches due to electrical defects. The Chief Electrical Engineer, South Eastern Railway, in a note submitted to us indicated that the incidence of fires was mainly on account of the following:—

- (i) Fire in wiring on roof due to temporary connection and repairs carried out on coaches in which cables had been cut and which had been temporarily repaired with copper and aluminium joints.
- (ii) Defective cell connection and main battery connection chiefly due to widespread pilferage of cell connections.
- (iii) Incidence of fires in lavatories, junction boxes and couplers due to theft on 15-way and 24-way junction boxes and consequential patch repairs.

458. In the course of evidence before us, the suggestion about the provision of a fuse in the negative wires in each compartment of steel bodied coaches was generally favoured. Col. D. McMullen also informed us that fuses are provided on both the positive and the negative wires in coaches on the British Railways. We suggest that fuses should be provided on both the positive and the negative wiring in steel-bodied coaches. This would provide additional protection against earth leakages and short circuits.

459. Some Chief Electrical Engineers and Divisional Electrical Engineers gave us to understand that a system of fortnightly inspection of all coaches has been introduced to check earth leakage in order to prevent fires due to electrical defects. We suggest that the checking of earth leakage with the help of test lamps should be intensified and carried out at the time of both primary and secondary maintenance of carriages. We further suggest that the results of these checks should be watched both at the divisional and headquarters' level. Spot checks by electrical engineers and supervisors to ensure that testing is carried out properly would, in our view, prove highly advantageous in toning up the quality of work done by staff.

460. Investigation of failures—The developing of a defect in a carriage or a wagon on the run involves an element of danger. The defects are likely to crop up in wheels, springs, brakegear, axle boxes, etc. It is, therefore, particularly important that such failures of carriages or wagons are investigated in a systematic manner. A retired Additional Member, Railway Board, during the course of his evidence, emphasised the need for technical investigation in case of failures of carriage and wagon components. To start with, in order to keep the workload within limits, the components which often fail should be identified and subjected to technical investigations. We suggest that a system for investigation of failures of certain selected carriage and wagon components be evolved on lines comparable to the investigation which is done at present in case of engine failures.

461. Our opinion as to the usefulness of investigations into such failures is supported by the practice recently adopted by the Northern Railway. We find that with a view to exercising a check and carrying out a detailed investigation into the cause of failure of a coach, fixing responsibility and taking remedial measures to avoid recurrence of the failure, the Northern Railway has defined a 'coach failure' as under:—

A coach, carrying passengers, is considered to have failed, when it is detached from a mail/express or passenger train enroute or causes a delay of one hour or more to the train to which it is attached due to:—

- (i) Any mechanical defect in running gear, brake gear, under-frame, spring assembly etc.
- (ii) Any electrical defect in the coach equipment, i.e. dynamos, batteries, kent coupler, wiring, air conditioning equipment, water raising apparatus, etc.

but a coach which is involved in an accident is not to be considered to have failed".

462. The Northern Railway has also prescribed a Coach Failure Report to deal with each case of failure of a coach whether on mechanical or electrical account.

463. Defect investigations—Despite the care exercised in the development of design of individual components, certain conditions arise where components either fail prematurely or are unable to give the performance expected of them. In such circumstances, it is necessary to conduct detailed defect investigations bearing in mind the initial design parameters adopted and the actual conditions under which these components work; and to carry out a scientific analysis of the conditions and causes which result in unsatisfactory performance of such components. Defect investigations point the way to improvement in quality and maintenance and this ultimately results in a more safe and reliable performance. We are glad to know that such investigations are carried out by the RDSO and modifications are issued as and when necessary. While this is indeed a continuous process, we suggest that results of investigations and recommendations made by the RDSO should be uniformly disseminated to all Railways for appropriate action.

464. Modifications—It is, however, not enough that modifications are notified to the Railways. Their execution and the organisation to watch their execution are equally important. With a view to examine to what extent and with what speed such modifications are carried out, we studied

ten modifications notified during the past few years which have a bearing on safety in the running of carriages or wagons. The results of this study are shown in Annexure IX.

465. We find from this study that instructions in regard to the same modifications are, at times, issued by two or three separate authorities, namely, the Railway Board, the RDSO and the Integral Coach Factory. There is also disparity in the dates of the issue of instructions concerning the same component. For instance, the instructions for the provision of safety chains to 'Beni' and 'Stones' 60 ampere dynamos on ICF metre gauge coaches were issued by the ICF under its letter No. CAI/A 65 dated 9-9-1965, by the RDSO under their letter No. EE/9/5 dated 28-1-1969 and by the Railway Board under their letter No. 69/Elec./495/3 dated 4-2-1969. We consider that in all such matters, it is the Railway Board who should give clear instructions setting target dates for carrying out the modification and should call for periodical progress reports.

466. We would also like to mention a few other aspects connected with this matter which came to our notice. The South Central Railway stated that they did not receive instructions regarding the modifications concerning (a) provision of safety straps to prevent the equalising stay from dropping and (b) replacement/repositioning of defective vacuum reservoir suspension straps on ICF coaches. The Northeast Frontier Railway stated that they did not receive instructions regarding provision of safety chains to 'Beni' and 'Stones' 60 ampere dynamos. It is needless for us to say that arrangements for notification of modifications ordered by the Railway Board to the Railway administrations should be such that a situation does not arise where a particular Railway remains unaware of them.

467. It is equally important that the modifications ordered in the carriages and wagons in the interest of safety in operation are executed within a specified time laid down after taking all the factors into consideration. It will also be seen from Annexure IX that the number of carriages on which modifications are yet to be carried out ranges between 21.2 per cent and 97.9 per cent. We also find that there was a time-lag between the receipt of instructions regarding the modifications and the issue of the orders on the part of the Railways which ranged between one month and 43 months in case of certain modifications. We cannot help expressing our concern at this state of affairs and are strongly of the opinion that the whole process of issue of modifications by the Railway Board and thereafter the execution at the Railways' level needs to be streamlined if the effort and thought which go in ordering such modifications for enhancing safety are to serve any useful purpose.

468. *Equalising beams on IRS metre gauge bogie coaches*—The function of the equalising beam on IRS metre gauge bogie assembly is to transfer the load to the two axles. Some serious derailments have been caused by the breakage of equalising beams.

469. In the Gorakhpur Workshops, it came out in evidence that 60 to 80 per cent of the equalising beams were found cracked at the neck during the last 6 to 8 months. At the New Bongaigaon Workshop, the incidence of failure of equalising beams was put at 40 to 50 per cent.

470. In their evidence tendered before us, some of the Chief Mechanical Engineers and the Works Managers mentioned that the equalising beams were found cracked mostly at the swan neck ends and that the failures

were not due to design defect but resulted from defective manufacture. One Works Manager, however, attributed the failure of the equalising beams to a design defect. We were advised that the incidence of failures was mostly on Jessops coaches. The equalising beams in about 1,300 coaches were made of rimming quality steel.

471. The causes of failure of equalising beams at the swan end were considered at various meetings of the Carriage and Wagon Standards Committee. The RDSO modified the design and its drawing No. W831 of August, 1968 which incorporates some improvements was finally approved of by the Railway Board. According to this, the equalising beam is to be manufactured from Class II steel to Specification No. IS 1875. Moreover, equalising beams are provided with safety clamps, the design for which was issued by the RDSO in 1968. The Railways have also been advised to prevent over-crowding on these coaches.

472. We understand that instructions exist for the examination of equalising beams of coaches every 3 months on the examining pits and in the sicklines. During POH of coaches in workshops, equalising beams are tested for cracks with magnaflux or ultrasonic equipment. These cracks are gauged and welded. The beams are also subjected to heat treatment and normalised as necessary.

473. It is suggested that equalising beams which fail in service should be replaced by those manufactured from Class II steel to RDSO's Drawing No. W831, and Specification No. IS 1875 and safety clamps should be provided as suggested by the RDSO. We have no doubt that if the measures proposed are implemented carefully in the workshops during POH of bogie coaches and in major sicklines as and when failures are detected, the incidence of failures of equalising beams will be reduced to the minimum.

474. *Laminated bearing springs of BOX wagons*—On the South Eastern Railway, there was and continues to be heavy incidence of breakage of bearing springs. The breakage occurs at the hanger and to avoid detachment of a BOX wagon when one of its springs is found broken, the South Eastern Railway has designed a clamp to be used at the broken end of the bearing spring to prevent its lateral movement. With the broken end of the spring strapped, the train is permitted to run at a restricted speed of 20 m.p.h. (32 km. p.h.) till the next train examining depot where the wagon is detached for repairs. The Chief Mechanical Engineer, South eastern Railway said that there had been about 1,200 cases in which broken springs were clamped during the last two and a half years without any derailment.

475. The Railway Board have also approved of the use of these clamps on loaded BOX, BRH and BOI wagons in case of breakage of bearing springs and have advised the General Managers of all other broad gauge Railways. Trains with a wagon with broken spring clamped can proceed at the restricted speed of 20 m.p.h. (32 km. p.h.) to the next major train examining depot where the broken springs are to be replaced.

476. It may be observed here that the Railway Board in their order No. 62/M(N)/204/6 dated 11-10-68 have stated that in case of breakage of springs of loaded BOX, BRH and BOI wagons at roadside stations, the train examining staff may fit clamps where facilities for changing springs do not exist to avoid detaching of wagons. These orders are somewhat impracticable since it is hardly ever that train examining staff are available

at roadside stations. If the duty of clamping of broken springs is to devolve on them, it is unlikely that the detaching of the wagon at roadside station can be avoided.

477. During the course of evidence mixed views were expressed in regard to the desirability or otherwise of clamping a broken spring and allowing the wagon to proceed. This diversity of opinion existed not only among the officers at the lower level but also among very senior mechanical engineers of the Railways.

478. While no case of derailment of a BOX wagon with its broken spring strapped has been reported, it appears that the speed of movement in the section would be seriously impaired if a goods load is to proceed at 20 m.p.h. (32 km. p.h.) to the next train examining station where the broken spring will have to be replaced. The distance between train examining depots is often 160 to 240 kilometres.

479. The broken end of a spring butts firmly against the bogie frame plate on account of the load. Whether the strap is effective enough to prevent angular displacement, however, seems doubtful. There is no permissive clause in the Conference Rules Part III containing rules for train examiners which permits any goods or coaching vehicle to run at any speed with a broken spring. Taking into account the various features, we consider that the appropriate course would be to detach a BOX wagon with a broken spring at the station where this defect is detected, and to summon the train examining staff for replacement of the spring. It is also suggested that the plates for the springs may be made from silico-manganese steel instead of the present specifications to reduce the incidence of breakage.

480. We might mention that a retired Member of the Railway Board stated that BOX wagons were invariably overloaded with minerals except when they were loaded for the Railways and the overloading was at times to the extent of 12 tonnes per wagon. The practice of overloading often resulted in the breakage of springs. It is essential that a satisfactory solution to the problem of overloading of BOX wagons should be found to reduce the incidence of breakage of springs.

481. *Hot Boxes*—We had, in Part I of our Report, noted that the incidence of hot boxes on coaching stock had shown a rising trend since 1965-66 on the broad gauge and the metre gauge and that the incidence on goods stock had remained more or less static during 1967-68 as compared to the previous year. We were advised by the Railway Board that detailed instructions had been issued to the Railways regarding the follow-up action to be taken on the short-term and long-term measures recommended in the report of the Director, Research (Hot Boxes) and the targets to be achieved.

482. We had asked for information regarding the progress of implementation of ten selected recommendations in the report. The position, as advised by the Railway Board, is shown in Annexure X.

483. We find from this information that in some cases either a programme for trials is still under preparation or indents for stores have been placed or an experimental order to prove the feasibility of manufacture of certain components at a reasonable cost has been placed, etc. The Director, Research (Hot Boxes) had observed in his report that many sicklines were in need of considerable improvements in respect of covered accommodation, pucca flooring in the working area, plane and equipment, pit accommodation, layout, lighting for night working and supervision. He had also

stressed the need for more field engineers and supervisors. We, however, find that all sicklines have not yet been fully provided with the necessary facilities. The need for an increase in the number of field engineers and senior supervisors is also under study by the Railways. We do not feel heartened by the progress of the implementation of the recommendations made by the Director, Research (Hot Boxes) in his special investigation report and would urge that energetic action may be taken to implement the recommendations.

484. We had, in Part I of our Report, observed that 16 per cent of the total number of derailments attributable to carriage and wagon defects occurred due to hot boxes, broken axles or journals. Such cases mostly arise due to a hot axle not detected in time. The Director Research (Hot Boxes) had recommended the installation of a few experimental hot box electronic detectors on the Indian Railways. Unfortunately, the Railway Board considered such an experiment as premature and highly expensive in view of the tight foreign exchange position. The function of the hot box detector is to detect and locate the position of any axle box which may be excessively hot on a train as it passes by the installation, and to display this information on a panel at the associated station. Since most of the goods stock is not equipped with roller bearing axle boxes, the need for detecting hot boxes in time will not only continue to have an important bearing on safety but would assume added importance with the present trend of long-distance high speed trains. We would therefore recommend research and study to develop a hot box detector for use on the Indian Railways.

485. *Maintenance of EMU coaches*—We were advised by the Central Railway that the most important problem in the maintenance of EMU stock was the non-replacement of overaged EMU stock which had been commissioned as early as 1925. This stock was to be replaced from the year 1963-64 onwards. It was, however, decided to keep the old stock in service and utilise the new stock to run additional suburban trains. It was expected that the old stock would be replaced by further supplies of stock from M/s Jessops and Co. However, due to various factors like the difficulty of foreign exchange, the programme of supply of new units by M/s Jessops and Co. has been delayed by nearly two years and this has caused a considerable strain on the maintenance organisation in maintaining the old stock. It was understood that the supply of new units from M/s Jessops and Co. would start arriving by about the middle of this year but even then, the replacement would easily extend upto the end of 1970. We strongly urge that whatever measures are needed to cause Jessops to fulfil the orders placed on them in respect of EMU coaches be adopted.

486. Early this year, we were advised by the Central Railway that the percentage of EMU coaches overdue periodical overhaul on that Railway was 18.1. It was stated that this figure was high due to very heavy repair work required to be undertaken on Breda and 1951 stock. We hope that with the increase in the capacity for periodical overhaul from 2 to 2.5 units per day and the anticipated increase to 3.5 units per day, the backlog in the periodical overhaul of EMU coaches would be cleared.

Brake Power

487. *Trains on steam traction*—According to the Railway Board's directive, at least 90 per cent of the vacuum cylinders on passenger trains on both the broad and the metre gauges must be effective. As for goods trains, as many as possible of these must run with a minimum of 85 per

cent effective vacuum cylinders on the broad gauge and 75 per cent effective vacuum cylinders on the metre gauge. This directive of the Railway Board, we understand, has been further modified to the effect that from 1-7-1969 no goods train on the broad gauge must be allowed to leave the originating station with less than 85 per cent effective vacuum cylinders.

488. In reply to the questionnaire addressed by us, the Railways had indicated that all passenger and goods trains on the broad and metre gauges are running fully vacuumed and the targets laid down by the Railway Board have been by and large achieved. In the evidence which was tendered before us a number of train examining staff and some mechanical engineers, however, pointed out that the percentage of non-effective vacuum cylinders on trains was usually considerable. One train examiner stated that in a load of 72 wagons, there were usually 16 to 17 inoperative vacuum cylinders; at times this number rose to 25. It also came out in evidence that the brake power shown in the train examiner's certificate was usually written out in a routine manner and did not correspond with the brake power actually obtained. A Chief Mechanical Engineer stated that it was difficult to create the prescribed amount of vacuum and the gauges in the locomotive and the brakevan of a steam-hauled long goods train hardly ever showed that it had been achieved. He said that the prescribed amount of vacuum could be obtained in strictly controlled conditions and not during the normal run of the train.

489. In their replies to the questionnaire, the Railways also stated that between the originating and the terminating points of a train, a drop of 2 to 8 per cent occurred in the percentage of active vacuum cylinders. This was attributed to improper adjustment of brake rigging, inferior quality of rubber fittings such as rolling rings, diaphragms and neck rings, wear and tear on the run, attaching and detaching of stock enroute, deficient performance of the cylinders, etc. During the course of evidence too, one mechanical engineer admitted that on the run of the train a heavy drop occurred in the percentage of effective vacuum cylinders.

490. The Divisional Superintendent, Khurda Road stated in his evidence that the staff had a hazy idea about the manner of testing of brake power of a train. He added that he and his mechanical officers had evolved a drill as to how to check the brake power and this had been widely circulated to the staff; in addition a suitable gauge for measuring the piston travel had been designed and supplied to the staff. The Divisional Superintendent added that the gauge had proved very useful in testing if the travel of the piston conformed to the limits laid down.

491. The General Manager, South Eastern Railway, informed us that unilaterally he had prescribed 90 per cent effective vacuum cylinders for all goods trains and steps had been taken to see that this did not remain a mere paper prescription. He, however, pointed out that the drive to have improved brake power on trains must be an all-Railway affair. He added that in respect of a number of trains received from adjoining Railways even the Railway Board's target of 85 per cent effective vacuum cylinders was not realised.

492. We entirely agree that the directives in regard to the prescribed percentage of effective vacuum cylinders on trains must be observed uniformly on all the Railways. This acquires special significance since a large number of goods trains run over more than one Railway. In fact the number of effective cylinders on a train must be a special point of check by the neutral train examiner. The safety of a train on the run depends to

a large extent on its brake power and it is of the greatest importance that the staff who are actually to operate the train know the real position in regard to the brake power available on the train. It is also essential that the requisite brake power should be available on all trains and difficulties arising either on account of defective material or other factors should be overcome.

493. Narrow gauge trains—The information which the Railways furnished in reply to our questionnaire showed that on some narrow gauge sections, passenger, mixed and goods trains were running non-vacuumed or partially vacuumed due to the fact that some of the narrow gauge locomotives did not have vacuum ejectors and the coaching and goods rolling stock was not fitted with vacuum brake arrangements. We cannot overstress the need for improving the brake power on narrow gauge trains some of which run on steep graded sections even though the speeds may be low. We understand that a decision has been taken to retain the existing narrow gauge lines. It, therefore, follows that endeavours should be made to improve the safety factor in respect of trains running on such sections. Locomotives, carriages and wagons should be equipped to the extent possible with vacuum brake apparatus and where this is not possible alternatives should be evolved as for instance, introduction of rail cars, etc. Reliance upon hand brakes for the safety of trains is in our view not only out-moded but also hazardous.

494. Diesel hauled trains—Diesel locomotives, both on the broad and the metre gauges are fitted with such powerful exhausters that in the case of goods trains, there is little or no indication in the driver's cab of the guard's action in destroying vacuum. In their evidence too, some guards pointed out the difficulty of stopping diesel hauled goods trains as the application of the vacuum brake in the brakevan did not give any indication to the driver. In our discussions with the Railway Board, we found that they appreciated the problem created by powerful exhausters on the diesel-electric locomotives. We hope that a satisfactory solution would soon be evolved.

495. Marshalling of anti-telescopic coaches on passenger trains—Detailed instructions have been issued by the Railway Board in regard to the marshalling of anti-telescopic coaches at either end of a passenger train to afford the maximum protection to passengers in the event of a collision. It came out during the course of evidence that the operating staff find it difficult to identify an anti-telescopic coach from other steel-bodied coaches. Even though the extant instructions permit attaching of a steel-bodied coach when an anti-telescopic coach may not be available, the anti-telescopic characteristics of the two, we are advised, differ and the integral stock being built by the Integral Coach Factory and the B.E.M.L. is, in this behalf, superior to the steel-bodied coaches built on IRS underframes. We would, therefore, suggest that on all anti-telescopic coaches, an identifying mark or code should be inscribed for the guidance of the operating staff so that in the event of stock of both types being available, the staff marshall anti-telescopic coaches in preference to other steel-bodied coaches.

496. Goods brakevans—It came out in evidence that with the introduction of diesel and electric traction, the riding qualities of four-wheeler brakevans on both the broad and the metre gauges at higher speeds are anything but comfortable, specially that of a broad gauge brakevan at a speed of 65 km. p.h. We would suggest that the spring suspension system of the broad gauge four-wheeler brakevans should be redesigned to provide

comfortable riding at speeds of 75 km.p.h. or more. We would also suggest that the suspension arrangements of the metre gauge four-wheeler brake-vans should be investigated with a view to improving their riding.

Carriage and Wagon Workshops

497. *Capacity*—During our visits to the workshops we observed that the capacity for periodical overhaul of coaches in the New Bongaigaon carriage and wagon workshops was short by 48 units (in terms of four-wheelers) per month. It was stated that the workshop was working in single shift except the wheel section which had a double shift and that the introduction of a second and a third shift in all the sections would augment the capacity of the workshop for periodical overhaul. We were told that on account of inadequacy of capacity, 48 units of coaches were being sent to the North Eastern Railway workshops for periodical overhaul. Even then the capacity was below the requirements and the Railway Board had allowed the Northeast Frontier Railway to undertake periodical overhaul of coaches at an interval of 18 months instead of 12 months. We do not consider this a satisfactory state of affairs. We hope that effective steps will be taken to increase the capacity of the New Bongaigaon workshop for periodical overhaul of coaches.

498. On the Western Railway, it was reported that the position in respect of goods stock overdue periodical overhaul was unsatisfactory and stood at about 17 per cent on 31-12-1968, because the demand for periodical overhaul was more than the capacity available in the workshops. Efforts were being made to increase the capacity for the periodical overhaul of goods stock and in this context the manufacturing of wagons in the workshops had been stopped. We were told that the Eastern Railway had also agreed to help the Western Railway in the periodical overhaul of wagons. It is essential that the percentage of goods stock overdue periodical overhaul on the Western Railway should be reduced considerably. Perhaps, the action now taken, namely stopping the manufacture of wagons, if taken earlier could have prevented such a situation.

499. On the Central Railway, about 25 per cent of the coaching stock was reported to be overdue periodical overhaul due to the coaches not being sent to the workshops in time. The need for regulating the flow of coaches into the workshops for periodical overhaul on the Central Railway is obvious.

500. *Broken axles and journals, and hot axles*—During our tours, we found the carriage and wagon workshops generally not adequately equipped with ultrasonic testing equipment. One Chief Mechanical Engineer, moreover, pointed out that the workshops were wanting in burnishing machines which are essential. The need to equip every carriage and wagon workshop with adequate ultrasonic testing equipment for testing axles and equalising beams of IRS metre gauge bogies cannot be over-emphasised. We also suggest that special efforts should be made to procure burnishing machines for the workshops. We find that the provision of burnishing machines in workshops has been recommended by the Director, Research (Hot Boxes) also.

501. *Roller bearing axle boxes*—Roller bearings are being introduced progressively to avoid hot axles. All the ICF and the BEML coaches are, at present, being turned out with roller bearing axle boxes. With a view to improving the service performance of goods stock and reducing the incidence of hot axles, broad gauge heavy duty wagons such as BOX, BOI,

BCX, BRH, BRS and special type of stock like explosives vans etc., are also provided with roller bearing axle boxes. Their use is being extended to broad gauge tank wagons too.

502. Some of the train examining staff and the mechanical engineers during the evidence tendered before us reported failures of roller bearing axle boxes. One Chief Mechanical Engineer said that the incidence of cage breakages was very high. Two things often gave trouble. Firstly, felt washers perished in use and dust got in. Secondly the locking of withdrawal sleeve was sometimes defective. At the Integral Coach Factory, Perambur, it was mentioned that self-aligned roller bearings had been introduced to take up track irregularities but these were not manufactured locally. A design had recently been given by the Research, Designs and Standards Organisation for high speed bogies with a view to utilising indigenously manufactured roller bearings. There had been some cases of seizure of roller bearings. It was stated that grease of approved specifications was to be used and if things were done in the proper manner there should be no failures. It was likely that in the reported cases of failures, substitutes might have been used. It was also stated that the facilities of enclosed dust-proof space available in the Integral Coach Factory may not be available on the Railways.

503. We had asked for information in regard to the cases of roller bearing failures on broad gauge coaching and goods stock for the year 1967-68. Only the Eastern, the Northern, the Southern, the South Central and the South Eastern Railways furnished the information. Of the 64 cases of roller bearing axle box failures on coaches, in 26 cases the roller bearing axle boxes failed within 8 months of mounting or the last attention given in shops, in 21 cases within 9 to 18 months and in the remaining 17 cases the date of mounting or last attention was not available. Of the 64 cases of failures, in 46 cases, the cause was not established as a result of the inspection of the roller bearings. For the failure of a roller bearing, the responsibility is normally fixed on the workshop or depot which attended it last or the manufacturer concerned. We, however, find that this was not done in 41 cases. Similarly, of the 89 cases of roller bearing axle box failures on wagons on these Railways, in 68 cases the failure occurred before the stock was due periodical overhaul and in the remaining cases the date of mounting or last attention was not given. The cause of failure was not established in 20 cases and in 40 cases the responsibility was not fixed. With a view to ensure proper attention to roller bearing axle boxes, we recommend that a periodical analysis of all cases of roller bearing failures on coaches and wagons indicating date, year and station of mounting, particulars of last attention given, cause and responsibility etc., should be made so that remedial action if required can be taken. We might mention that the Research, Designs and Standards Organisation had stated that the Railways had been made conscious of the fact that a seized roller bearing may lead to serious consequences.

504. It was mentioned by some of the mechanical engineers during their evidence that the roller bearings manufactured both by the NBC and the SKF failed occasionally. We therefore suggest that the Research, Designs and Standards Organisation should go into each case of failure and analyse every aspect including the materials used and the manufacturing accuracies and suggest remedies. We attach the utmost importance to this matter in view of the increasing use of roller bearings on Indian Railways.

505. The roller bearing axle boxes are attended to only in the workshops at the time of periodical overhaul which is scheduled at intervals of 9 to 12 months in case of coaches and three and a half years in case of wagons. We consider it important that all the carriage and wagon workshops are provided with suitable and adequate facilities for overhauling of the roller bearing axle boxes at the time of periodical overhaul or whenever such axle boxes are sent to the workshops. It is also essential that the workshops where roller bearing axle boxes are attended to are provided with dust-proof facilities.

506. We are advised that on the Japanese National Railways, the standards of inspection and testing of roller bearing have been laid down. The rolling stock are regularly sent for general overhaul to the workshops after having run certain specified distances. In the workshops, the roller bearings are dismantled, washed and minutely inspected by an electro magnetic flaw detector, and reassembled and oiled and returned to service only after their capability for perfect performance until the next general overhaul is certified. It seems to us that the adoption of a similar system would be of advantage to the Indian Railways.

507. *Machines*—During our visits to workshops on the Railways, we were informed that some of the machines in the workshops were obsolete and quite a number of them were overaged. We had already referred to this feature when dealing with loco workshops. The obsolete or overaged machines affect the quantity and quality of work. We, therefore, suggest that the position in regard to the machines should be surveyed in all the workshops and a programme should be drawn up to replace the outdated or overaged machines on a phased basis.

508. *Examination of coaches after periodical overhaul*—After periodical overhaul in the workshops and before being sent out, coaches are subjected to neutral control examination. We found that the percentage of rejection of coaches in certain workshops was between 25 and 56. The rejection of the coaching stock was mainly due to defects in buffer heights, wheels tight to gauge, trough flooring corroded, brake beams safety hangers broken, etc. The percentage of rejections reflects the quality of work done in the workshops. We urge that measures should be taken to see that the coach is in a perfect condition when offered for examination after periodical overhaul. Though a large percentage of rejections is due to minor defects which are rectified in a short time, even so steps should be taken to improve the standard of workmanship to minimise the percentage of rejections.

509. *Neutral control examination*—The Railways in their replies to our questionnaire expressed divergent views on the usefulness of neutral control examination. The opinion generally held was that while neutral control examination of stock should continue in respect of major sicklines and workshops, it had outlived its utility in case of yards because of the Railways themselves going in for intensive examination of loads. A retired Additional Member of the Railway Board, however, expressed the view that neutral control examination should not be cut down but may be increased and necessary facilities should be provided for the job to be done properly. We feel that neutral control examination serves as a further check and has been generally useful in keeping wagons in good fettle and we consider that nothing should be done to weaken it in view of its independent character. We understand that in the past, wagons were subjected to neutral control examination when they were interchanged between different Railways. The neutral control examination centres were thus generally located at the junction points of two Railways. We are told that the

flow of traffic has now assumed an all-India pattern and fast goods trains like the super express goods trains run to a time-table between Howrah and Delhi, Delhi and Carnac Bridge, Delhi and Madras, etc. In addition, a number of express through goods trains run from one corner of the country to another passing through several yards without examination. We feel that in view of the changing pattern of traffic, neutral control examination need not necessarily exist at the boundary points of the Railways as used to be the case in the past. The Railway Board should examine the existing set-up of neutral control examination and decide upon the various points at which it should be located.

510. *The Indian Railway Conference Association Rules Part III* contain instructions for the examination of stock. This book was printed in 1962 since when a very large number of correction slips have been issued. One of the Railways in its reply to our questionnaire has stressed the need for revision of the Conference Rules. We endorse this suggestion. The rules contained in this publication should not only provide comprehensively for the examination and repairs of all types of stock which have been introduced on the railways over past several years but the provisions having a direct bearing on safety in railway operation as distinct from those simply meant to keep the coaches and wagons in good fettle should be clearly specified. Moreover, in order to reduce the incidence of derailments due to carriage and wagons defects, the neutral control examination should lay greater emphasis on the compliance of safety rules and regulations in the matter of maintenance of stock. The conception of interchange of goods stock between the Railways which led to the creation of neutral control examination and evolution of Conference Rules has undergone a radical change. This also underlines the need for the revision of the Conference Rules Part III. We understand that the Railway Board have under scrutiny a draft prepared by the IRCA for the examination and maintenance of all types of coaching stock.

511. *Checks by Neutral Control Flying Squad*—The Indian Railway Conference Association publishes annually a 'Report on the broad and metre gauge wagon pools and neutral control of wagon examination' which includes the results of the surprise checks conducted by the neutral control flying squads. We suggest that the results should clearly specify the percentage of wagons found unsafe to run to the total number of wagons checked. At present, the number of wagons with rejectable defects is indicated in its report. The figures now published do not indicate the extent of unsafe defects on the stock checked as there is no clear definition of what is called 'safe to run' examination.

512. *Overaged rolling stock*—Based on the traffic projections made by the Working Group of Rail Transport for the Fourth Plan, the originating freight traffic in 1973-74 has been assessed at 264.70 million tonnes. As regards non-suburban passenger traffic, an increase of 23.06 per cent in vehicle kilometres is anticipated during the five-year plan period. The estimates of suburban passenger traffic have been determined by trend projection. The requirements of each metropolitan area have been separately assessed. For this traffic target, the total plan outlay of Rs. 1,700 crores was considered necessary. In view of the smaller allocation of funds, however, the railway plan has been curtailed to a total investment level of Rs. 1,525 crores.

513. The reduced allocation will be sufficient only to carry 255 million tonnes of originating freight traffic and support an increase of 19.8 per cent in non-suburban vehicle kilometres during Fourth Plan period. It has

been proposed by the Ministry of Railways to bridge the gap between transport availability and its requirement by continuing as much overaged rolling stock in use as possible.

514. The provision for locomotives on replacement and additional account, if fully implemented, is expected to leave 1,450 locomotives (in steam equivalents) on the broad gauge, 682 on the metre gauge and 239 on the narrow gauge overaged at the end of the Fourth Plan. In respect of wagons 16,996 wagons (in four wheelers) on the broad gauge, 4,949 wagons on the metre gauge and 2,837 wagons on the narrow gauge will remain overaged. A total of 3,635 bogie passenger coaches of all gauges will similarly continue in service beyond their prescribed life.

515. It is obvious that special attention will have to be given to such stock during overhaul as well as during day-to-day maintenance. The periodical overhaul may have to be given to such stock even at shorter intervals to keep them road-worthy and safe for operation. We would urge the Railway Board to give serious consideration to this matter so that the use of a larger proportion of overaged rolling stock by itself would not adversely affect the element of safety in train operation.



CHAPTER XI

STORES

516. Whether it is a question of keeping locomotives or rolling stock in good fettle or of maintaining signalling equipment and permanent way to prescribed standards, it is of vital importance that to accomplish the task successfully the supply lines that convey spare parts and stores from the supplier to the ultimate user keep moving with clock-work precision. We had in Part I of our Report referred to the fact that considerable time and energy of the executive officers is spent in chasing after the procurement of items which are in chronic short-supply. The evidence which was tendered before us lends considerable weight to the complaint in regard to the irregular supply of spare parts and stores, and indicates that the position is worse than we had thought.

517. *Shortage of spare parts and stores*—In many of the workshops, we received complaints from the Chief Mechanical Engineers, the Works Managers and other workshop staff in regard to the shortage of wheels, tyres, rubber fittings, etc. A number of these witnesses admitted that often the work was held up on account of these shortages. On one Railway, the Chief Mechanical Engineer reported that 20 locomotives were standing idle awaiting the supply of roller bearings. On another Railway, the Chief Mechanical Engineer reported that the shortage of stores and spare parts affected the carrying out of scheduled repairs of locomotives. This witness, in particular, referred to the difficulty in getting tyres, and brake blocks and said that he 'had to beg' for wheels, pistons, cross-heads, etc., from other Railways. Many of the officers and staff admitted that to keep the rolling stock in service they have to resort to the practice of cannibalisation without which a good number of the railways' valuable and revenue earning rolling stock assets would remain idle and out of operation. There were widespread complaints in regard to the scarcity of certain imported raw materials from which certain vital components are manufactured indigenously. This complaint was voiced particularly by the Eastern Railway according to whom the components manufactured from imported raw material were in continuous short supply.

518. We were also apprised of the difficulties caused by non-availability of rubber-fittings, brake blocks and small parts like truss bar nuts, trolley hanger nuts, grover washers, pins, cotters, etc., which affect the proper maintenance of carriages and wagons. On one Railway there were complaints in regard to the non-supply of spare parts for BEML coaches, particularly, roller bearing wheels and bogie bolster springs.

519. Shortages of components like relays, battery materials, signal pulleys, bulbs, signal glasses, etc., were often highlighted in the evidence of signal inspectors and maintainers and of many of the Chief Signal and Telecommunication Engineers. Particular mention was made of certain imported components like relays, pneumatic treadles, signal lamps, parts of air compressors, points machines, and spare parts for route relay interlocking installations. These witnesses were greatly exercised about the spare parts of the more sophisticated types of installations.

520. Some Controllers of Stores during their evidence claimed that the compliance percentage of the stores was from 94 to 95. On the face of it, this would seem a high accomplishment but as one General Manager warned, assessing of the availability of the stores in terms of the compliance percentage is apt to give a distorted picture. He pointed out that even if for argument's sake the compliance percentage may be 94, the shortage of the remaining 6 per cent of items which may be essential for maintenance would easily hold up the work and immobilise valuable rolling stock and other assets.

521. We refer, in some detail, to the procedure of procurement of stores on the Railways in the subsequent paragraphs. Here we would like to stress two things. Firstly the policy in regard to imports of vital parts required for maintenance of valuable assets as also the procedure of release of foreign exchange needs to be thoroughly reviewed so that not only is the available foreign exchange utilised to the best possible advantage but also the short-sighted policy of saving some little foreign exchange at the cost of keeping valuable assets idle is avoided. Secondly, the chimerical impression which the compliance percentages of 90 to 95 evoke is apt to prevent the focussing of the administration's attention on the need to streamline their supply lines apart from the smugness which these percentages induce in the Controller's of Stores of which we found a fair amount of evidence.

522. *Inferior quality of tools and stores*—Shortages apart, we found, during our tours of the various Railways, the staff complaining constantly about the inferior quality of tools, stores and spare parts. The signal maintainers and inspectors whom we met, were almost without exception exercised about the poor quality of hand tools like adjustable spanners and screw drivers, and spare parts for the maintenance of signalling equipment like bulbs, battery material, etc. They represented that frequent breakage of tools and failure of components increased their workload manifold. More than one witness complained that the indigenous substitutes of imported signalling components had turned out to be highly unsatisfactory.

523. While we were on a visit to a major loco shed, the enterprising Divisional Electrical Engineer organised in the headlight section of the shed, a small exhibition of certain spare parts and components which were brand new but which could not be put to use as they were either of the wrong size or they did not match with the components in conjunction with which they were supposed to be used. This improvised exhibition which we visited demonstrated amply how frustrating it would be for the executive and the staff to be unable to put to use even the brand new parts when on paper the depots may be well stocked.

524. Complaints were voiced at numerous places in regard to the poor quality of rubber rolling rings and other rubber fittings. It was pointed out that vacuum cylinders were frequently rendered inoperative due to the poor quality of rubber rolling rings and as a result, the consumption of this item had gone up enormously.

525. The Chief Electrical Engineers of two Railways complained to us that the maintenance of electric locomotives has suffered because of the use of indigenously manufactured spare parts of inferior quality. A General Manager attributed this state of affairs to the lack of rigid inspection of the tools, stores and spare parts accepted for the Railways. Yet another General Manager stated that the practice of accepting the lowest tenders is responsible for this state of affairs. Other witnesses told us that in order

to comply with the government's policy of encouraging small-scale industry, the procurement of tools and spare parts is being made generally on the basis of the lowest quotation tendered. Since in most cases it is not possible to furnish the detailed specifications of the articles required, the process of purchase is initiated purely on the basis of nomenclature of the tool suitable for a particular job. The tenderers who quote the lowest rates usually submit a sample which is fairly satisfactory from the point of view of size, dimensions and specifications. When, however, bulk supplies are made the materials received are of sub-standard quality, the dimensions are not true and the finish far from accurate. It was also stated that most of the tenderers have no quality control organisation or testing facilities required particularly for precision machine tools nor have the manufacturing units any qualified technicians or engineers. Often the parts are manufactured in tiny workshops housed in a small hutment or a garage. No gauges or jigs are available with the manufacturers to ensure accuracy or the right finish and they are blissfully ignorant of the actual purpose for which the parts are required. The raw materials used for manufacturing such tools and parts are far inferior in quality and strength to those used by reputed manufacturers who may have put in years of research and experience before they manufacture and market their products. In the stores depots on the Railways the material is generally accepted after visual inspection and the sub-standard parts passed on to the consumers who thereafter bear the headache.

526. The Director General, Supplies and Disposals, stated before us that the inspectorate wing in his organisation inspects the stores for the Railways also and makes sure that the items supplied conform to the specifications laid down before they are despatched to the users. The inspectors after inspecting the stores put their seals on them. When asked whether the manufacturers invariably put their markings on the articles, the Director General, Supplies and Disposals, stated that the choice whether to put their marking on the article or not rests with the manufacturers and that the consignee has the right to reject the stores at the destination if he finds that the material does not conform to the quality prescribed. The rejection has, however, to be made within a prescribed period.

527. We have no doubt that the inferior quality of tools, stores and spare parts, apart from turning out to be false economy in the end is highly frustrating inasmuch as it throws additional burden on the staff in the performance of their duties and renders the work of repair and maintenance more onerous. In many instances where due to the unreliable quality of spare parts, shoddy repairs are effected, safety too would be at stake. Needless to say, it would be more prudent and economical to provide tools, stores and spare parts of the requisite quality, readily identifiable and covered by adequate guarantees by paying a proper price in the beginning. In our view, the rejection clause referred to by the Director General, Supplies and Disposals, would often become inoperative in the absence of manufacturers' markings on the tools and spare parts. Furthermore, since, in practice, the inferior quality of the tools or spare parts becomes known only when they are put to actual use, the period of limitation usually renders the rejection clause ineffective.

528. We lay great stress on the need to restore in the purchasing authority the self assurance that rejection of the lowest tender would not be misconstrued if the purchasing authority has carefully applied its mind

to the various factors and that what the administration expects of its purchasing officer and agents is to purchase wisely and not merely cheaply. We had, in Part I of our Report, occasion to refer to over-emphasis on accepting the lowest tenders due to the fear in the purchasing authority of criticism which may be engineered by the rejected tenderers. We reiterate here that the administration should endeavour to insulate its purchasing officers from such criticism if it is satisfied that the discretion was exercised for good and sufficient reasons.

529. *Manufacturers' markings*—We also consider that as a rule all tools and spare parts must have the manufacturers' markings on them. A manufacturer who adopts a trade mark becomes, in our opinion, honour-bound to give due regard to quality. Insistence that the manufacturers imprint their markings on their articles is, in our view, bound to give a fillip to the quality of manufacture.

Procurement of stores through the agency of Directorate General of Supplies and Disposals

530. The equipment and stores for the Railways are purchased partly by the Railway Board and by the Railway administrations direct and partly through the agency of the Directorate General of Supplies and Disposals which is a centralised purchasing wing functioning at present under the administrative control of the Ministry of Foreign Trade and Supplies. The work of procurement of stores through this agency is in accordance with the allocation of business rules of the Government of India.

531. We had in Part I of our Report referred briefly to difficulties which are being experienced in respect of items procurable through the Directorate General of Supplies and Disposals and had observed that despite some improvement having been effected recently, the procedure still continues to be far from simplified. These observations received affirmation from the evidence tendered before us by a large number of officers including several Controllers of Stores and other senior railway officers.

532. It was pointed out to us that heavy delays occur in acquiring stores through this agency because firstly the channelising of indents through an outside agency is itself a time-consuming process and secondly the purchase officers in the Directorate General of Supplies and Disposals not being responsible for railway operation are not appreciative of the urgency with which stores may be needed and give undue importance to, and engage themselves in, needlessly cumbersome and time-consuming forms and procedure. The singleness of purpose which must exist between the purchasing agency and the user is missing when railway equipment and stores so essential for the safety of railway operation have to be acquired through an agency not responsible to the railway organisation. Where promptitude should have been the prime consideration, a system has instead come about which is riddled with procedural complexities and consequent delays.

533. We examined in some detail the procedure for placing the indents, the delays in their submission, coverage of the indents, materialisation of supplies and other associated matters like the lead time, the carrying cost of inventory, the remuneration paid by the Railways for the services rendered by the Directorate General of Supplies and Disposals, the advantages claimed for the bulking of indents, etc.

534. A publication known as "Standard Vocab-cum-Programme Book for submission of indents by Indian State Railways" lays down the various schedules including the dates of receipt of indents by the Directorate General of Supplies and Disposals and the interval of time required for checking and bulking of indents, processing of bulked indents, placing of contracts and finally the lead time, i.e., the likely period after which the supplies would commence depending on the nature of the commodity and its availability in the market. This book was published in 1950 and was last revised in October, 1959. We have been given to understand that the revisions have been mostly in respect of the dates of submission of indents to the Directorate General of Supplies and Disposals and that little or no revision has been made in respect of time intervals for the remaining operations. In other words, the time required for processing of indents in the office of the Directorate General of Supplies and Disposals and the lead time required for procurement of stores has thus remained more or less unaltered for nearly two decades. We are unable to appreciate why despite the enormous industrial advancement made in this country during the last two decades and the improved materials management methods which are being employed everywhere, the time intervals for processing of indents and procurement of stores should continue to remain unaltered. We have no doubt that their continuance in the present form is unjustified.

535. The Director General, Supplies and Disposals, during his evidence before us stated that the indents complete in all respects including detailed specifications must be placed on him about two years in advance in most cases. He also mentioned that the delays in the procurement of stores were mostly on account of late receipt of the programme indents from the Railways and that more than 50 per cent of the indents were received late. He expressed the view that if it is to be ensured that the supplies are made available in time, it is essential that the indents be submitted to the Directorate General of Supplies and Disposals according to the prescribed schedule.

536. Obviously, it is unrealistic to expect an organisation as complex as the Railways which has been developing at fast pace and undergoing modernisation to assess its requirement of stores 24 months ahead. Firstly, the Railways have to work to an annual budget. To keep in step with this pattern the procedure for all normal items of railway equipment and stores should be such that demands can be progressed well within the budget year. This means that the placing of orders and the deliveries of material to which the orders refer should be compressed as far as possible within a period of six to nine months and should not in any case exceed a 12 month period. Any pattern, therefore, which visualises a period as long as 24 months between the placing of a demand and its final and complete fulfilment appears to be unrealistic against the background of budgetary provisions. Furthermore factors like an ever-increasing and yet changing pattern of traffic which is closely linked up with the growth of industrial activity in different parts of the country, the unpredictable law and order situation in the country which on the Railways is reflected in the wide-spread incidence of thefts of railway material and cases of vandalism, make precise forecasting of requirements in any event difficult but with a procedure which prescribes a lead time of two years make things impossible.

537. In order to examine to what extent the complaint of delays in indenting was justified, we obtained an analysis of the position for a period of 12 months, i.e., from February, 1968 to January, 1969, from the Railway Board. This is shown below:—

Months	Total number of programme indents received by the DGS&D		Programme indents received late by the DGS&D	
	Indents	Items	Indents	Items
1	2	3	4	5
February, 1968
March, 1968	45	116
April, 1968	41	74
May, 1968	150	583
June, 1968	23	130
July, 1968	68	162
August, 1968	82	203
September, 1968	74	180
October 1968	68	163
November, 1968	59	71
December, 1968	62	95
January, 1969	113	192
Total	..	849	2,118	62
				104

Overall percentage of late indents and items

Number of indents	..	..	7.3%
Number of items	..	..	4.9%

538. We were told that the Railway Board had conveyed this position to the Directorate General of Supplies and Disposals in current correspondence on the matter. It would be seen that the overall percentage of late submission of programme indents has been of the order of 7.3 per cent on the basis of the number of indents and 4.9 per cent on the basis of the number of items. The Directorate General of Supplies and Disposals conceded during his evidence that he has been authorised to procure stores against the indents received in time leaving out those received late. In the light of these facts, the delays which occur in the procurement of stores can hardly be ascribed to the late receipt of indents alone.

539. On the other hand, when it comes to the coverage of indents and the materialisation of the supplies, the picture is different and heavy delays take place according to the information furnished by the Railway Board. This is reproduced at Annexure XI.

540. It will be seen that during 1966-67, only 29 per cent of the indents of the Eastern Railway and 36 per cent of the Western Railway were covered in time. The delay in the remaining varied from 1 to 11 months. Similarly, the extent of delays in the supplies on the basis of originally prescribed delivery periods ranged from 1 to 20 months. The position, thus, is depressing both in respect of the coverage of indents and the materialisation of supplies through the Directorate General of Supplies and Disposals.

541. In addition to these delays, we find that the supplies against several contracts for which the original delivery dates had expired, in some cases years ago, still remain outstanding. The position as on 31-1-1969 was as under:—

Year A/T was placed							Number of contracts outstanding for supply as on 31-1-69
1961	..	..	..	..	..	..	4
1962	..	..	..	..	..	..	97
1963	..	..	..	..	..	..	257
1964	..	..	..	..	..	..	520
1965	..	..	..	..	..	..	1,044
1966	..	..	..	..	..	..	624
1967	..	..	..	..	..	..	951
1968	..	..	..	..	..	..	847
				Total	..	..	4,344

542. The above data were compiled in the office of the Director General of Supplies and Disposals. When during the course of his evidence, he was shown these figures, he stated that perhaps the position may have arisen because these items may not have been available in the country to the required extent. When we asked him why the contracts should have remained outstanding and not been cancelled even after a lapse of so many years, no clear reply was available. In the face of these facts, we cannot but express our keen disappointment over the delay in procurement of railway equipment and stores through the agency of the Directorate General of Supplies and Disposals.

543. Tracing the growth of this central purchasing agency historically, a department of the Government known as the 'India Stores Department' was established in 1922 on the plea that "the local officials are, at present, greatly handicapped for want of information regarding facilities for using the existing Indian sources owing to the absence of a central authority.....". If this was the justification of the central purchasing agency, it is no longer valid in the wake of large scale industrialisation which has since taken place, the regional dispersal of industries and the growth of newspapers and other mass media which convey industrial and commercial intelligence all over the country.

544. The Director General, Supplies and Disposals, had also contended that it would be inadvisable to have more than one central purchase organisation. For one thing, the economies of centralised purchase have to be weighed against the disadvantages which might flow from such a system and obviously there should be no hard and fast rule about this. Besides, the functions of purchase cannot be divorced from the allied functions of standardisation, control on inventory, value analysis and control on consumption. Scientific materials management is possible only if the function of purchase is integrated with the other functions of materials management.

545. *Advantages claimed on behalf of bulking*—The most talked of advantage of procurement through the Directorate General of Supplies and Disposals is claimed to lie in the economy which results from the

bulking of demands for common user items. This price advantage cannot obviously be considered in isolation from the other essential features of the system, namely, the long lead time and the correspondingly heavy cost of carrying inventory, the fees paid by the Railways for availing the services of the Directorate General of Supplies and Disposals etc. As already stated, the Directorate General of Supplies and Disposals requires the indents to be placed on them about two years in advance. Apart from the fact that an assessment of requirements so much in advance would be unrealistic, it enjoins on the consumer to maintain heavy inventories to guard against a possible failure during this long period and this, in our view, would set at naught the advantage of bulk purchase. During our discussions with the Railway Board, it was indicated that the price advantage in the items which are bulked may perhaps be of the order of 4 to 5 per cent. As against this, the cost of carrying inventories was stated to be of the order of 15 to 20 per cent. Taking into account the interest which has to be paid, the maintenance cost of depots, the account of wastages and deterioration etc., the level of stock which has to be maintained at present, is, according to the Railway Board, on the basis of seven months' requirements. As against this, we were told that the Japanese National Railways keep stock equivalent to three months' requirements, the U.S. Railroads two to three months' and the British Railways five months'. The Railway Board stated that they could cut down the inventories from seven to five months' requirements if they were allowed to procure the supplies themselves. Moreover, in the case of a large number of items, as for instance, petroleum and other oil products, cement, coal, steel, etc., the advantage of bulking of indents is only illusory since in such materials either the price is controlled or the items are provided at fixed prices by public sector undertakings. Besides, there are several items of stores which are either exclusively required for the Railways or are procured separately for the Railways even if some other consumers might be using them. This, thus, leaves only a few common user items which admit of bulking at present. It, therefore, appears to us that too much has been made of the benefits resulting from bulking and that too little attention has been paid to the disadvantages inherent in the system of procurement of stores through an agency not involved in the running of the railways. In our view, the disadvantages in this system clearly outweigh the advantages.

546. Taking all these factors into account, we are clear in our minds that the responsibility for procurement of stores and spare parts for the Railways should rest squarely with the Railway Board and the Railway administrations without bringing into picture the agency of the Directorate General of Supplies and Disposals. This will lend stability, permanence and continuity to the procurement of railway equipment and stores and would impart a greater sense of urgency to the officers of the Railways entrusted with the responsibility of materials management. We were assured by the Railway Board that they have the basic organisation to replace this agency for procurement of their own stores and with a little strengthening here and there at a cost which would be far less than the remuneration which the Railways, at present, are called upon to pay to the Directorate General of Supplies and Disposals for purchase and inspection work, they would be in a position to take this job over. We consider that this is a matter which can brook no further delay.

547. *Powers of purchase of stores*—We do not, of course, think that the mere transferring to the Railway administration of the functions of the Directorate General of Supplies and Disposals insofar as they relate

to procurement of railway stores will take care of all the short-comings with which the stores organisation of the Railways is at present beset. Some reorganisation of the existing system and streamlining and simplification of the procedure with a view to meeting the growing requirements of the Railways would in our opinion be necessary.

548. We find that over the years while the levels of prices of materials on the one hand and of the consumption of stores on the other have been rising steadily, the powers of purchase vested in the Controllers of Stores have not kept pace. For nearly 9 years, i.e. from 1958 till 1967, the Controllers of Stores were authorised to make purchases of the items procurable through the Directorate General of Supplies and Disposals upto the value of Rs. 10,000 in each case or upto the value of Rs. 25,000 in each case in respect of items the value of the annual requirement of which did not normally exceed that limit. In May, 1967, the monetary limit of direct purchase of the DGS&D items of stores by the Controllers of Stores was raised from Rs. 10,000 and under to Rs. 25,000 and under in each case irrespective of the value of the annual requirement of those items. We feel that the present powers of purchase may not be adequate to meet the requirements keeping in view the price level and the needs of Railways. The opinions voiced in the evidence tendered before us cast considerable doubt on the adequacy of the existing powers.

549. It was suggested to us in evidence that the powers of purchase of Controllers of Stores should be increased to Rs. 50,000 or even Rs. 1,00,000 with suitable increase in the powers of other purchase officers. It was also suggested that the limits of purchase through 'single tender' and in case of cash purchase, should be raised to Rs. 2,000 and Rs. 1,000 respectively instead of the existing limits of Rs. 200 and Rs. 250. Suggestions were made to reduce the scope of Finance concurrence in the purchase of stores. One proposal made to us was that the Finance need not be associated for purchases upto Rs. 10,000 and in cases where the value of purchases exceeds Rs. 10,000, the stages of consultation with Finance should be confined only to assessment of quality, association on tender committee and issue of contract. Several witnesses urged that there is need to develop a proper buyer-seller relationship in respect of safety items of stores so that the seller becomes more committed and has a greater stake in his dealings with railways. For a tie-up of this nature, an assurance to one or two firms in respect of each important item that the requirements would be bought from them for a specified period, say three years, may be necessary. This change in attitude would generate quality consciousness as well as the need for timely delivery of stores.

550. We consider that these suggestions deserve the most careful consideration of the Railway administrations. We also feel that the powers of purchase of stores at all levels should be kept under constant review by the Railway Board so that they are adequate to cope with their ever-increasing needs.

551. *Decentralisation of stores*—We came across much diversity of opinion in regard to the efficacy of the present stores organisation on the Railways in which, from a limited number of depots, the consumers in far-flung areas are kept fed. Some Railways felt that any further dispersal of the depots would result in larger inventories having to be carried; others, however, felt that decentralisation of stores depots and setting up

of smaller depots near about the principal consuming centres would lead to a more efficient supply service. It was suggested that under the present arrangement where only a limited number of stores depots feed the various sections of the Railways, there is considerable strain on the Divisional organisation which has to undertake numerous stores functions and that by providing a suitable organisation under a stores officer to the Divisional Superintendent the divisional organisation would receive considerable logistic support. This stores organisation could then, with advantage, take over the functions of dealing with imprest stores, supply of requirements for works in progress, running of stores depots for spare parts and tools at major sheds, dealing with sales, books, forms and stationery, unutilised assets and what is most important relieve the users of the burden of chasing after the procurement of stores from distant depots.

552. Among the advocates of decentralisation, the Southern Railway had prepared a blueprint of a plan which according to this Railway would not involve any appreciable extra expenditure to the administration. According to this plan, the existing stores set-up of the Railway could be dispersed so that there would be a stores depot under the supervision of a stores officer at an appropriate place in each division and at each important consuming point. The plan appeared to us a useful one and we thought it fit to circulate it to other Railways to elicit their views. Some Railways have since favoured adoption of similar schemes; some others consider that a scheme of this nature would involve extra expenditure and a few have chosen to reserve their opinion. During our discussion with the Railway Board it was contended that with schemes of this sort the inventories would go up to some extent. While there may be truth in this, we feel that the problem of chasing of stores by executive officers is one which calls for an effective solution. This is possible only if closer coordination is established between the indentor and the supply depot. While there may be strength in the argument that decentralisation would result in somewhat larger inventories, the increase in the inventories would be applicable mostly to the slow-moving items and is hardly likely to be applicable to the fast-moving items. The Railways have already introduced the A-B-C analysis system of stock items which facilitates categorisation of items on the basis of value analysis and indicates the extent of attention and control required to be exercised on the different categories of items. By a judicious exercise of controls prescribed by this system and of careful classification of fast-moving and slow-moving items, it may be possible to decentralise the stores organisation in a manner that the advantages of having stores depots contiguous to the consuming centres are derived without subjecting the system to disadvantages arising out of larger inventories.

553. *Scientific methods of inventory control and materials management*—We had in Part I of our Report, stressed the need to adopt scientific methods of inventory control and modern materials management techniques. The planning and procurement of about 30,000 stock items which are required to cater to repetitive demands and a large number of non-stock items which are equally essential for the efficient operation of the railways necessitate the use of up-to-date techniques. We consider that for effective and efficient materials management and the solution of various complicated problems, the Railways would do well to seek specialist guidance from quarters who have the requisite expertise in materials management.

554. *Manning of the stores organisation*—It was pointed out to us that among the factors ailing the stores organisation on the Railways, one is that the ministerial staff working in the stores branches of the zonal Railways are ill-qualified to handle the stores work which in the course of time has become highly technical and complex. We agree that materials management today is a specialised job. Over-dependence on ill-qualified ministerial staff would create problems for the stores organisation rather than solve them. We have been given to understand that the necessity for reorganisation of the stores department has been recognised by the Railway Board and a Committee of the Controllers of Stores have recommended certain revised yardsticks. We have no doubt that their recommendations would go a long way in improving the stores organisation.



CHAPTER XII

THEFT, VANDALISM AND SABOTAGE

Theft of railway equipment and vandalism

555. The evidence tendered before us by the staff and officers at all levels showed that thefts and vandalism on the Railways are a serious problem from all accounts. It was contended that about 50 per cent of the failures of signalling and interlocking gadgets is due to the theft of or tampering with the components. We have already indicated how widespread the theft of copper wire is on the railways and how this results in prolonged interruption to communications. The evil, we were told, extends to components of locomotives, coaches, wagons and electrical equipment having even a small copper or brass element.

556. We had the opportunity of hearing the views of the Inspector General, Railway Protection Force on the subject. He said that theft or destruction of railway equipment is a crime and the responsibility for its prevention lies on the State police. He assured us however that this matter was being constantly raised by him with the Inspectors General of Police of the different States. At times when the incidence of thefts or destruction of railway property assumed alarming proportions on a particular section, patrolling of track by patrol specials is also introduced. The witness admitted that some thefts were committed with the connivance of railway employees and the personnel of the Railway Protection Force. In his view, with the coming into force of the Railway Property (Unlawful Possession) Act in 1968, it would be possible to deal with the problem of theft of railway equipment more effectively. The witness pointed out some other difficulties like the shortage of prosecuting inspectors but said that a solution of these difficulties was being found.

557. We were advised that it is difficult to establish the identity of stolen railway equipment in a court of law. 'I.R.' is not a registered mark and hence does not preclude its use by others. If registration of this or any other mark would be helpful in identifying railway property in unlawful possession, we do not see why the Railways should not have a registered mark for railway materials and parts on which such mark can be imprinted as this would obviously make it possible to take effective action against persons in unlawful possession of railway property under the Railway Property (Unlawful Possession) Act.

558. The Inspector General stated that the Railway Protection Force is not armed with suitable powers of arrest. The power to arrest flows from section 12 of the Railway Protection Force Act, 1957, which reads as under :

- "12. Any superior officer or member of the Force may, without any order from a Magistrate and without a warrant, arrest—
(a) any person who has been concerned in an offence relating to railway property punishable with imprisonment for a term exceeding six months, or against whom a reasonable suspicion exists of his having been so concerned; or

(b) any person found taking precautions to conceal his presence within railway limits under circumstances which afford reason to believe that he is taking such precautions with a view to committing theft of, or damage to, railway property."

559. It will be seen that this section permits an officer or member of the Railway Protection Force to arrest any person for an offence relating to railway property punishable with imprisonment for a term exceeding six months. For offences not punishable with such imprisonment he has no powers. The powers conferred under this section of the Act are thus restricted.

Sabotage

560. During the eleven years from 1958-59 to 1968-69, 28 cases of serious accidents were caused by tampering with track. Of these, in one case the accident enquiry report of the Additional Commissioner of Railway Safety stated that the derailment was due to the placing of pieces of ballast on rails probably by some cowboys to satisfy their own curiosities. The remaining 27 cases were found to be the result of wilful tampering with track according to the enquiry reports.

561. Of the 27 cases, 13 were accepted by the police as having been caused by sabotage. In 11 cases, the police did not agree that the accidents were the result of sabotage. Of the remaining 3 cases, in one they opined that it was not unlikely for a locomotive to develop some unusual defect leading to derailment and even if it were a case of sabotage, it was by some disgruntled and mischievous railway employee and not by an outsider. In another, the police, in the first instance, registered a case under section 128 of the Indian Railways Act which deals with the offence of endangering safety of persons travelling by railway by wilful act or omission and not under section 126 which deals with the offence of maliciously wrecking or attempting to wreck a train. This case is still reported to be under investigation. In the remaining one case, the action taken by the police is not available.

562. We are advised that in none of the cases in which the police disputed the findings of the Additional Commissioners of Railway Safety to the effect that the accidents were the result of sabotage, was the matter taken up by the Railway administration with the State Government at a higher level.

563. Of the 13 cases of accidents in which sabotage was accepted as the cause by the police, they were unable to trace the culprits in seven. One case is still under investigation. In the remaining five cases in which the culprits were apprehended, in three the accused were acquitted, in one case the culprit was sentenced to death and the remaining one case is subjudice.

564. We cannot help coming to the conclusion from the above data that cases of wilful tampering with track do not receive from the State police and the other authorities concerned with law and order the attention that they deserve. The Kunzru Committee had suggested that in every State having vulnerable sections of railway track, special arrangements should be made for officers to specialise in the investigation of the problem of tampering with track. The Railway Board had also stressed the need for improving the quality of the investigating officers of the State police by giving them special training as far as the problem of tampering with

railway track was concerned. The Ministry of Home Affairs were apprised of the position. They, however, did not accede to this request on the ground that as less than one per cent of the total train accidents were due to sabotage, prevention of such accidents could better be done by the Railways themselves.

565. We regret we are unable to subscribe to the view of Ministry of Home Affairs. We have already pointed out in Part I of our Report that accidents due to sabotage have been increasing during the last 15 years and the action taken to trace the culprits has been largely ineffective. Besides, if the problem were viewed only from the viewpoint of percentage of train accidents attributable to sabotage, it is apt not to place the gravity of accidents resulting from sabotage in correct perspective. During the last eleven years, the percentage of the number of persons killed, of those injured and the loss to railway property in serious accidents due to tampering with track when compared with the consequences of all serious accidents were 29.8, 29.4 and 26.1 respectively. By their seriousness, these accidents created considerable commotion in Parliament and the Press. We therefore, consider that this is a matter for serious concern and we do not agree with the Ministry of Home Affairs that the matter may be left to be tackled by the Railway Ministry themselves. We would urge the Ministry of Home Affairs to ask the State Governments to take adequate measures to apprehend the culprits and to prosecute them. The prevention of sabotage falls wholly and solely in the jurisdiction of the State police. It is for them to judge the vulnerability of a particular section for sabotage and to introduce patrolling of the railway track and take other measures as and when necessary. The State police have the means to keep aware of the activities of saboteurs and anti-social elements who are indulging in or are likely to indulge in unlawful activities. The Railway Protection Force has its own intelligence but even their reports are sent to the State police.

566. We would also point out that the Additional Commissioner of Railway Safety is a technical and highly experienced officer independent of the Railway administration and when after due investigation he comes to the conclusion that the accident was due to wilful tampering with track, the State police authorities should ordinarily be guided by the results of these investigations. In any event where there is difference of opinion between the State police and the Commission of Railway Safety in regard to whether the accident was due to sabotage, the Railway administration should not allow the matter to rest at that but should pursue this with the State Government at a higher level.

567. By way of interest, we reproduce below the State-wise position of the 27 serious accidents resulting from wilful tampering with track:—

Bihar	..	..	..	..	..	..	8
Assam	..	..	..	..	..	..	4
Andhra Pradesh	..	..	..	..	..	..	3
West Bengal	..	..	..	..	..	..	3
Mysore	..	..	..	..	..	..	3
Uttar Pradesh	..	..	..	..	..	..	2
Maharashtra	..	..	..	..	..	..	1
Gujarat	..	..	..	..	..	..	1
Madhya Pradesh	..	..	..	..	..	..	1
Rajasthan	..	..	..	..	..	..	1

568. We had examined the provisions of the law dealing with offences of theft, vandalism and sabotage. We have already referred to section 12

of the Railway Protection Force Act, 1957, which confers the power to arrest on the personnel of the Railway Protection Force. The power to arrest under this section becomes operative only in conjunction with section 126 of the Indian Railways Act, 1890. Section 126 of the Indian Railways Act, 1890, provides for action against persons maliciously wrecking or attempting to wreck a train. This section reads as under:

"126. If a person unlawfully—

- (a) puts or throws upon or across any railway any wood, stone or other matter or thing, or
- (b) takes up, removes, loosens or displaces any rail, sleeper or other matter or thing belonging to any railway, or
- (c) turns, moves, unlocks or diverts any points or other machinery belonging to any railway, or
- (d) makes or shows, or hides or removes, any signal or light upon or near to any railway, or
- (e) does or causes to be done or attempts to do any other act or thing in relation to any railway,

with intent, or with knowledge that he is likely, to endanger the safety of any person travelling or being upon the railway, he shall be punished with imprisonment for life or with rigorous imprisonment for a term which may extend to ten years :

Provided that in the absence of special and adequate reasons to the contrary to be mentioned in the judgment of the court, where a person is punished with rigorous imprisonment, such rigorous imprisonment shall,—

- (a) in the case of a first conviction, be not less than three years, or
- (b) in the case of a subsequent conviction, be not less than seven years."

569. The Inspector General, Railway Protection Force, pointed out that the words "with intent or with knowledge that he is likely to endanger the safety of any person travelling or being upon the railway" make it difficult to secure a conviction under this section as it is difficult to establish positively the intent or knowledge on the part of the offender.

570. We do feel there is need for suitably amending section 12 of the Railway Protection Force Act, 1957 and section 126 of the Indian Railways Act, 1890 in order that a person indulging in theft or destruction of railway property or in wrecking or attempting to wreck a train can be arrested and proceeded against with a reasonable chance of success. We need hardly add that the menace of theft of and tampering with railway equipment is too serious to be treated merely as an ordinary law and order problem as it adversely affects safety in railway operation.

571. In addition to what we have stated in the foregoing paragraphs and in paragraph 566 of Part I of our Report, it appears to us necessary that steps should be taken to educate public opinion and to rouse the social conscience of the people as to the heinous nature of the crime of sabotage and of activities like vandalism and theft of railway material which result or may result in serious disasters involving loss of life of innocent persons travelling on the railway. We make a special appeal to public men, educationists and the Press who have the opportunity and responsibility of moulding public opinion to do their duty in this connection. We also feel that the Railway Ministry and the State Governments should keep in mind the necessity of such an approach all the time.

CHAPTER XIII

THE COMMISSION OF RAILWAY SAFETY

Historical

572. The origin of the Commission of Railway Safety (hereinafter referred to as the Commission) lay in the appointment of Consulting Engineers under the Government of India with the object of exercising effective control over the construction and operation of the first railways in India, which were owned and managed by private companies incorporated in the United Kingdom. Later, when the Government undertook the construction of railways, the Consulting Engineers were designated as Government Inspectors. In 1883, their position was statutorily recognised. Twenty years later, the Government Inspectorate was placed under the Railway Board, which was established in 1903.

573. Section 181(3) of the Government of India Act, 1935, provided that "functions for securing the safety both of the members of public and of persons operating the railways, including holding of inquiries into the causes of accidents" should be entrusted to officers independent of the Federal Railway Authority. This was the genesis of the independent Commission which we have today.

574. The Pacific Locomotive Committee headed by Lt. Col. A.H.L. Mount, then Chief Inspecting Officer, British Railways, also suggested that steps should be taken to end the subordination of the Railway Inspectorate to the Railway Board. In para 210 of their report of 1939 the Committee observed as follows:—

"We understand that, under the Government of India Act, 1935, it is contemplated that the Inspectorate will be separated from the control of the Railway Board. This is very desirable, in so far as it will eradicate the present anomaly of the Board being the Inspecting as well as the executive authority. We were informed that the Board fully appreciate the position, and would welcome the change, although it appears that, in practice, Government Inspectors have generally retained their freedom of judgement."

575. The principle of separation from the Railway Board was endorsed by the Central Legislature which recommended that "Senior Government Inspectors of Railways should be placed under the administrative control of some authority of the Government of India other than the Railway Board." Accordingly, the Railway Inspectorate, since designated as the Commission of Railway Safety, was placed under the administrative control of the Department of Communications in May, 1941, and subsequently under the Department of Posts and Air, and the Ministry of Transport and Communications successively. Since May, 1967, the administrative control over the Commission is exercised by the Ministry of Tourism and Civil Aviation.

Functions

576. Under the law, the Railway Board are the Safety Controlling Authority. The responsibility for safe operation of railways thus rests with

the railway administration. That responsibility cannot be shared by officers of the Commission whose duties are set out in the paragraphs that follow.

577. The functions of the Commission are carried out by a small cadre of officers consisting of the Commissioner of Railway Safety (hereinafter referred to as Commissioner) and five circle officers known as Additional Commissioners of Railway Safety (hereinafter referred to as Additional Commissioners). The Commissioner as head of the organisation is the principal technical adviser to the Government in all matters pertaining to the Commission. He directs the technical activities of the organisation, and supervises the work of the Additional Commissioners under his administrative control. He is responsible for advising the controlling Ministry in matters relating to recruitment, transfer and promotion of officers and staff, budget and expenditure. His duties may be summed up as under:—

- (a) Issues, directives and instructions for the guidance of Additional Commissioners in respect of the following:—
 - (i) Holding of statutory inquiries into serious accidents including those not covered by statutory instructions or notifications;
 - (ii) Inspections prior to opening of all newly constructed lines including doublings and electrification of existing lines;
 - (iii) Running of new types of locomotives and rolling stock.
- (b) Communicates his views to the Railway Board, as necessary on:—
 - (i) Designs, standards, specifications and procedure for construction, working and maintenance of assets in all branches of railway engineering and operation including Civil, Mechanical, Electrical and Signal Engineering, electric traction, working of trains, etc.
 - (ii) Modification, interpretation and enforcement of General and Subsidiary Rules and the various Technical and Operating Manuals of the Railways.
 - (iii) Procedure for holding of inquiries into accidents and inspection of new lines.
- (c) In addition, he is required to perform the following duties :—
 - (i) To scrutinise inspection reports received from the Additional Commissioners on the open lines of Government Railways and forward important items relating to safety contained therein to the Railway Board for necessary action.
 - (ii) To forward the inspection reports of Additional Commissioners on company-managed railways with his recommendations to the Railway Board.
 - (iii) To scrutinize the accident reports submitted by the Additional Commissioners on serious accidents and advise the Government with respect to the acceptance or otherwise of their findings and make his own recommendations for the prevention of similar accidents.

578. His field duties consist of routine inspection of sections of Railways, visits to circle offices and headquarters of the zonal Railways. At times, the Commissioner, if he thinks it necessary, holds an inquiry into a serious accident himself.

579. The functions of the Additional Commissioners derive their authority from section 4(2)(a) and (b) of the Indian Railways Act, 1890. These are :

- (i) To inspect new lines with a view to determining whether they are fit for public carriage of passengers and to report thereon to the Central Government.
- (ii) To make such periodical or other inspections of any railway or of rolling stock used thereon as the Central Government may direct.
- (iii) To make inquiries into train accidents on railways.
- (iv) To perform other duties as are enjoined upon him by the Act or any other enactment for the time being in force relating to railways.

580. The duties under item (i) above have been further amplified in sections 18 to 21, and 23 and 24 of the Indian Railways Act as follows:—

- (i) To inspect a railway or a part of it and submit a detailed inspection report to the Central Government.
- (ii) To sanction the execution of all works including new works affecting safety of running lines.
- (iii) To report to the Central Government any condition which may endanger the safety of the travelling public and make recommendations.
- (iv) To inspect a closed railway prior to reopening.
- (v) To sanction the opening of new railway lines on behalf of the Central Government.

581. We have been assured by the Commissioner that full cooperation and assistance of every kind is given by the Railway administration to him and the Additional Commissioners and matters which require their attention are discussed by the Commissioner with, the Chairman, Members and Directors of the Railway Board.

Organisation

582. The functions set out above are carried out by the Commissioner of Railway Safety and five Additional Commissioners. The Commissioner is generally assisted by a Deputy Commissioner who also acts as a leave reserve officer.

583. Till 1941 when the Inspectorate was separated from the Railway Board, there was no post of Commissioner of Railway Safety. In 1941, the post of Chief Government Inspector of Railways, now designated as Commissioner of Railway Safety, was created to enable the Ministry under which the Inspectorate (designated now as Commission of Railway Safety) was placed to exercise effective technical control.

584. The jurisdiction of each Additional Commissioner at present is given below:—

Circle	Railway(s)
Northern Circle, Lucknow	.. .. Northern Railway
North Eastern Circle, Calcutta	.. .. Eastern and North Eastern Railways
South Eastern Circle, Calcutta	.. .. South Eastern and Northeast Frontier Railways.
Southern Circle, Bangalore	.. .. Southern and South Central Railways.
Western Circle, Bombay	.. .. Central and Western Railways.

585. Each Additional Commissioner also exercises jurisdiction over company-managed railways, Port Trust railways and District Board lines located within his circle. Such lines constitute about 1.7 per cent of the aggregate route kilometrage of Indian Railways.

586. It may be mentioned that prior to February, 1960, there were only four circles—Northern, Eastern, Southern and Western. On account of development works under the Five-Year Plans, the workload increased very considerably, especially in the then Eastern Circle which included the Eastern, the South Eastern and the Northeast Frontier Railways. An additional circle, known as the Construction Circle, was set up in Calcutta on 1st March, 1960, to deal with major projects on the three Railways. These major projects consisted of electrification on the Eastern and the South Eastern Railways and the new Dandakaranya-Bolangir-Kiriburu railway construction. Sanction for continuance of this additional circle was obtained year after year. This position was reviewed during the year 1967-68 and it was decided in April, 1968, to revise the jurisdiction of the five circles as indicated above. Even so the fifth circle is still temporary.

Inquiries into accidents

587. One of the important functions of the Additional Commissioners is to inquire into serious accidents. The rules for inquiries into accidents are contained in Railway Board notification No. 59-TTV/42/1 dated 11th April, 1966, entitled the "Railway (Notices of and Inquiries into Accidents) Rules, 1966". The relevant portions of para 8 of the rules relating to the inquiries into serious accidents are reproduced below:—

"8(2) Every accident to a train carrying passengers which is attended with loss of human life or grievous hurt as defined in the Indian Penal Code to a person or persons in the train or with serious damage to railway property of the value exceeding Rs. 50,000/- and any other accident which in the opinion of the Commissioner of Railway Safety or the Additional Commissioner of Railway Safety requires the holding of an inquiry shall be deemed to be an accident of such a serious nature as to require the holding of an Inquiry.

8(3) Where the Commissioner of Railway Safety considers the holding of an inquiry into an accident necessary, he may either hold the inquiry himself or direct the Additional Commissioner of Railway Safety to do so."

Explanation—The inquiry by the Additional Commissioner of Railway Safety shall be obligatory only in those cases where the passengers killed or grievously hurt were travelling in the

train. If a person travelling on the foot-board or roof of a passenger train is killed or grievously hurt or if a person is run over at a level crossing or elsewhere on the railway track an inquiry by the Additional Commissioner of Railway Safety shall not be obligatory. Similarly, if in a collision between a road vehicle and a passenger train at a level crossing, no passenger in the train is killed or grievously hurt the Additional Commissioner of Railway Safety shall not be obliged to hold an inquiry. For the purpose of this rule, workmen's trains or ballast trains carrying workmen shall also be treated as passenger trains and in the event of a workman getting killed or grievously hurt as a result of an accident to the train, an inquiry by the Additional Commissioner of Railway Safety shall be obligatory."

588. The holding of an inquiry by the Additional Commissioner into an accident of the description specified in para 8(2) of the rules is thus obligatory. Other accidents not deemed to be of serious nature and averted collisions, breaches of block regulations, signals passed at danger, attempted train-wrecking, collisions at level crossings, etc., are inquired into departmentally. The rules also provide that if the Additional Commissioner, due to pre-occupation or otherwise, is unable to hold an inquiry into a serious accident, he may request the Railway administration to arrange for a departmental inquiry. When he receives the proceedings of the inquiry held by a committee of railway officers, he is required to prepare a report if he agrees with the findings. If on the other hand he differs from the conclusions reached in the departmental inquiry he may if he considers it necessary take additional evidence, carry out tests and prepare his report. We consider that in cases where he agrees with the findings of the departmental inquiry, it should be sufficient if he expresses his views on the findings and the recommendations made instead of preparing his own report.

589. The procedure for preparation and submission of reports of statutory inquiries into accidents by the Additional Commissioner of Railway Safety is contained in an office memorandum of the Commissioner dated May, 1948. The time schedule for submission of reports—preliminary, draft and final—was decided upon at a meeting held in April, 1950, by the Railway Board with the Secretary to the Government of India in the Ministry of Communications. The minutes of this meeting specify the following schedule:—

Date of Accident	...	...	...	A
Preliminary Report and provisional findings				A + 8
Draft Report	...	...	...	A + 28

The preliminary and draft reports are confidential documents.

590. According to the existing procedure, the Additional Commissioner sends copies of his draft report to the Railway administration, the other Additional Commissioners, the Commissioner and the Railway Board. The Railway administration sends its remarks on the draft report to the Railway Board, the Commissioner of Railway Safety, and the Additional Commissioner concerned. The other Additional Commissioners also send their comments on the draft report to the Commissioner and to the Additional Commissioner concerned. Thereafter the Commissioner prepares a

note on the Additional Commissioner's report taking into consideration the Railway administration's and the other Additional Commissioners' remarks and sends it to the Railway Board with his recommendations. The Railway Board thereupon examine the report with the Railway administration's remarks and the Commissioner's note and record their views. It is thereafter that the final report is prepared. The report is required to be finalised within 15 days of the receipt of the Railway Board's views. We shall revert to this procedure later.

591. The main sections of the Additional Commissioner's report of an inquiry into an accident are: (a) Introductory, (b) Relief measures (c) Site features, (d) Tests carried out, (e) Summary of evidence, (f) Discussion of evidence and (g) Conclusions. Recommendations and observations relevant to the inquiry form an annexure to the report.

592. Train accidents other than those in which inquiry by the Additional Commissioner is obligatory are inquired into departmentally by railway officers. The evidence shows that by and large thorough inquiries are made by committees of railway officers and except on a few occasions, the Additional Commissioners do not find it necessary to make references to the Railways on such departmental inquiry proceedings. The more important accidents falling under section 83 of the Indian Railways Act which are inquired into by the Railways are summarised in the Commissioner's annual Report on the Working of the Commission of Railway Safety. In Appendix B of the Commissioner's Report for the year 1966-67, 44 such items enumerating brief details of the accidents, cause and responsibility and suggestions for safeguards are enumerated.

593. During the five year period, 1963-64 to 1967-68, 180 significant recommendations were made by the Commission as a result of inquiries into serious accidents. These recommendations have, by and large, been accepted by the Railway Board and the Railway Administrations advised accordingly. A small percentage of these is under correspondence between the Commissioner and the Railway Board.

594. We discuss later in this chapter the question of strengthening the cadre of the Additional Commissioners. Here we would like to say that there are some serious accidents which are not required to be inquired into by the Additional Commissioner under the present Rules even though the consequences in some of them are serious. The Kunzru Committee had recommended that the Additional Commissioners should also inquire into some important train accidents in which an inquiry is not obligatory under the Rules. We too are of the view that the Additional Commissioners should inquire into certain types of accidents which are not at present provided for under the rules. We have in mind, in particular, two types namely (i) accidents at manned level crossings involving collisions between trains—whether goods or passenger—and road vehicles in which there is loss of life or grievous injury to passengers in the road vehicles and (ii) collisions and derailments of goods trains in which there is loss of life or grievous injury to any person.

595. Besides these inquiries an Additional Commissioner must make such other inquiries into serious accidents as the Commissioner considers necessary for him to inquire into. As for the Commissioner himself, he may if he considers fit or if his Minister so requires him, make inquiries into accidents of a serious nature. We might mention that, in some recent cases of serious accidents the Commissioner held inquiries personally.

596. The part of the inquiry report of the Additional Commissioner which contains recommendations is highly important from the point of view of remedial action and prevention of recurrence of similar accidents. We, therefore, consider that the recommendations made by the Additional Commissioners should be incorporated as an integral part of the report under the heading "Remarks and Recommendations" instead of being an annexure to the Report. We also suggest that line plans showing essential features and photographs where necessary should be appended to such reports.

597. We would like to observe here that a period of 60 days from the date of accident should ordinarily suffice for sending the final report by the Commissioner to the Railway Board and the Railway administration. With the changes in procedure which we suggest elsewhere we consider that this period should be adequate for finalising the report. This would not only result in significant reduction in the time taken in finalising the report but would be conducive to building up of public confidence in the organisation of the Commission of Railway Safety.

Inspections

598. Upto the year 1953, the annual inspections of the Indian Government Railways were carried out by the Government Inspectors of Railways (now called the Additional Commissioners of Railway Safety). In 1953, the Railway Board, with the concurrence of the Ministry of Transport and Communications, decided that these inspections should be discontinued as the General Managers were responsible for assuring the safety of operation on their respective Railways. It was, however, left open to the Government Inspectors to carry out inspections for their own purposes or arrange ad hoc visits to study any particular aspect of railway working with which they may desire to make themselves familiar. The Government Inspectors were assured that for this purpose, all necessary facilities would be given by the Railway administration. The Ministry of Transport and Communication, on their side, reiterated these instructions to the Government Inspectors and in these instructions required the latter to carry out annually an inspection of 20 per cent of the route mileage of each Government-owned railway, fitting their inspections, as far as possible, with the inspections of the General Manager with his heads of departments.

599. The Additional Commissioners of Railway Safety are at present thus responsible for the detailed inspection of company-managed railways only. In the case of Government Railways, the General Managers are responsible for such inspections but the Additional Commissioners accompany them wherever it is possible to do so.

600. Inspection reports of company-managed railways are sent by Additional Commissioners of Railway Safety direct to the Railway Board and Railway administrations concerned for necessary action. A copy of these inspection reports is also endorsed to the Commissioner. Inspection reports of Government Railways, however, are sent to the Commissioner, who in turn, forwards extracts from these reports to the Railway Board for further action.

601. The Kunzru Committee had expressed dissatisfaction on the extent of inspections carried out by the Additional Commissioners. The extent to which the Additional Commissioners of Railway Safety are able to carry out inspections is shown in the annual report of the Commission of

Railway Safety. We find that the General Manager and Heads of departments whom the Additional Commissioner accompanies as convenient to him generally carry out their inspections during the period November to March. The Railways are keen to adhere to the programme and targets of construction of new lines, doubling and electrification before the end of the financial year and with that objective, require the Additional Commissioners to inspect and authorise the opening of lines for the passenger traffic during the same period. Furthermore, should one or more serious accidents occur during the said period, or if an Additional Commissioner were to hold charge of another circle in addition to his own, his programme of annual inspections gets affected and the Additional Commissioner is unable to comply with the annual quantum of inspections of open lines. It therefore seems to us that if the Additional Commissioners are to carry out all the inspections expected of them, it would be necessary to strengthen their cadre. We shall advert to this aspect later.

602. The Kunzru Committee had also expressed the opinion that in their inspection reports, the Additional Commissioners seldom cover safety aspects. They had expressed the view that a check should be exercised on the quality and adequacy of inspections carried out by the Additional Commissioners. From the safety point of view, inspections by Additional Commissioners of Railway Safety are no doubt advantageous. We are informed that the Commissioner has already taken steps to see that the inspections when made are thorough. He ensures this through personal discussions with the Additional Commissioners during his visits to the latter's headquarters.

603. We also notice that in pursuance of the recommendations of the Kunzru Committee, the conditions in respect of maintenance of assets on the Railways are embodied in a separate chapter headed "General Appreciation of the Conditions of Safety in Operation and Maintenance of Railways" in the Commissioner's annual report. While we see no objection to the inclusion of a separate chapter on the subject in the Commissioner's annual report, it must be remembered that the main purpose of the inspections is to apprise the Railways of the defects found so that they are remedied as soon as possible. The annual report of the Commissioner should, in our view, deal with this aspect only broadly.

604. We might mention that the procedure whereby the reports of inspections by Additional Commissioners which are carried out in the company of administrative and divisional officers of the Railways and are forwarded to the Commissioner is, in our view, a defective procedure. We suggest that these reports should be forwarded directly to the Railways concerned and copies may be sent to the Commissioner and the Railway Board. This would facilitate immediate attention by the Railway administration to the defects noticed. According to the present procedure it takes several weeks before the inspection notes of the Additional Commissioner reach the Railway administration through the Commissioner and the Railway Board.

605. The Kunzru Committee had recommended that the Additional Commissioners should be relieved of the functions of certifying the fitness of new locomotives and rolling stock and of sanctioning the movement of over-dimensional consignments. The Government were, however, unable to accept this recommendation on the grounds that the existing practice serves as a double check on the fitness of new locomotives and rolling stock before placing them on line and on the movement of over-dimensional consignments. The Government, therefore, decided to maintain the

status quo. It seems that these duties have been assigned to the Additional Commissioners to serve as an additional check in the interest of safety and we, therefore, think that the Additional Commissioner should continue to perform them.

Independence of the Commission

606. We have already indicated that upto 1941, the Commission or the Inspectorate as it was then called was under the Railway Board. It was, however, felt that the Commission should be independent of the Railway Board and accordingly in 1941, it was taken away from the Railway Board and placed under another department. Since then the Commission has remained under one Ministry or the other but not under the Railway Ministry.

607. On the basis of evidence tendered before it, the Kunzru Committee had observed that there was a great deal to be said in favour of the Railway Inspectorate working under the Railway Minister. They had, however, refrained from making a positive recommendation and had expressed the hope that the matter would be considered further by Parliament.

608. We have given this matter our earnest consideration and have come to the conclusion that it would be better if the Commission continues to be attached to a Ministry other than the Railway Ministry. We may point out that in the United Kingdom the corresponding authority is under the Ministry of Transport which is also the controlling Ministry for the railways. The Railways Board in the United Kingdom, unlike our Railway Board, is however, a statutory corporation and the Ministry of Transport has powers to give only general directions to the Railways Board. The result of such a situation in the United Kingdom is that the Chief Inspecting Officer (the counterpart of the Commissioner here) is the technical adviser to the Ministry of Transport whereas the Railways Board is not directly the adviser to the Ministry of Transport in railway matters. In India, the position is different; the Railway Board is the secretariat of the Railway Ministry and is the adviser to the Railway Minister in all matters pertaining to Railway administration. In these circumstances it seems to us definitely advantageous that the Commission of Railway Safety remains attached to another Ministry so that its position as a body independent of the Railway Board would be, and remain, quite clear to the public. We might point out that in our discussions with the Railway Board as also the Ministry of Tourism and Civil Aviation under whose administrative control the Comission functions at present, this view found support with both.

609. We have noted that during the past nearly three decades now, the Commission has been attached to different Ministries from time to time depending upon the reshuffling of portfolios and jurisdiction of various Ministries. This experience has not been a very happy one because this has not given the Commission of Railway Safety a permanent anchorage. Inevitably this has led to inadequate attention being given to the affairs of the Commission by the Ministry to which it has been attached for the time being. We recommend that from now on the Commission should find a permanent location and that this should be with the Ministry of Home Affairs. This may have the additional advantage of attaching the Commission to a Ministry which enjoys high prestige. It will also help in quicker solutions to the establishment and other problems associated with individual members of the Commission as well as the Commission as a whole.

610. What, in our view, is required to make the Commission, in effect, independent is a change in the procedure of working of the Commission and of the recruitment and status of its personnel. We have already set out the present procedure in respect of the inquiries conducted by the Additional Commissioners. So far as the preliminary report is concerned, we see no objection to its being made as early as possible with provisional findings. But we do feel that the manner in which the draft report is dealt with robs it of objectivity and independence. The draft report of the Additional Commissioner, according to the present procedure, is subject to remarks by the Railway administration concerned and by the Railway Board in addition to its being noted upon by the Commissioner. It is only thereafter that the final report emerges. We are of the view that this procedure detracts from the independence of the Additional Commissioner a great deal. In fact, the sending of the draft report to the other Additional Commissioners for their comments also dilutes the responsibility of the Additional Commissioner who must be fully responsible for his report. Such a procedure, furthermore, results in unnecessary delays in finalising the report. We are of the opinion that the responsibility for compiling the report of an accident inquiry should be placed squarely on the Additional Commissioner concerned. All that is necessary is that the report should be submitted to the Government through the Commissioner who may, if he considers it fit, discuss it with the Additional Commissioner concerned. The Additional Commissioner however need not alter any part of his report if he feels that no alteration is called for. Thereafter the report should be considered as finalised. It is this final report which should be sent by the Commissioner to the controlling Ministry, the Railway administration concerned and the Railway Board. This procedure will go a long way in establishing the independence of the Commission. It is to this final report including the recommendations therein that the Railway Board and the Railway administration should give their consideration. In case there is any difference of opinion between the Commissioner and the Railway Board or the Railway administration with respect to the conclusions or the recommendations therein, the difference would have to be ironed out in a conference between the Commissioner and the Railway Board in such manner as they think fit.

611. We would like to make it clear here that there is nothing improper in informal consultation between the Additional Commissioner and the Railway administration during the time that he is conducting his inquiries or preparing his report. The discretion however whether any consultations are necessary should rest with the Additional Commissioner.

612. Linked with this is the issue of the making of rules for inquiries into accidents by the Additional Commissioner. At present these rules are made by the Railway Board. We have been given to understand that before these rules were revised in 1966, close consultation with the Ministry of Tourism and Civil Aviation and also the Commission of Railway Safety took place and their views were duly considered before the Railway Board revised the rules. Nonetheless, we do not see the merit of an arrangement whereby the rules for conducting of inquiries by the Additional Commissioners of Railway Safety are made by the Ministry of Railways. It would be conducive to the strengthening of public confidence in the independence of the Commission if the rules in this behalf are framed by the Ministry to which the Commission is attached. This Ministry may, when necessary consult the Railway Board while framing such rules. We would suggest that from now on whenever any changes in the present rules are required

these should be considered and issued by the Ministry controlling the Commission. Furthermore, any directions as to the work of the Commission should be issued by that Ministry and not by the Railway Board.

613. Yet another question which has relevance to the independence of the Commission from the viewpoint of public confidence is whether the public including trade unions and the press should be permitted to be present when the Additional Commissioner makes his inquiry into an accident. According to the present procedure the public and the press are excluded from the inquiries conducted by the Additional Commissioners and the reports made by them are generally not published soon after they are finalised. We are of the opinion that it would inspire public confidence in the independence of the Additional Commissioners if the public including trade unions and the press are admitted to the inquiries. They would, of course, have no say in the inquiry itself but may be present only as observers. It may be added that the admission of the public including trade unions and the Press should be at the stage when the Additional Commissioner takes oral evidence of the witnesses.

614. Public confidence would, we feel, be further enhanced if the reports of the Additional Commissioners are published soon after they are finalised except where it is decided to launch a prosecution. All that is necessary is that the report that is intended for publication should be available to the press soon after its finalisation. We understand that such published reports are already put out by the Government as priced publications and this practice should continue.

615. In advocating the publication of inquiry reports, one exception must be made namely, in respect of accidents where a prosecution is to be launched. We had discussed the question of prosecution of railway servants in part I of our Report. We had suggested that an amendment to section 101 of the Indian Railways Act may be necessary to ensure that no railway servant is prosecuted without the sanction of the authority competent to appoint him or a higher authority. We had also added that in most accident cases departmental action would meet the ends of justice and prosecution of railway staff ought to be necessary only in a comparatively few cases of a serious nature. We find that the Government have already accepted this recommendation. If action on the above lines is taken it would be relatively easy for the Railway administration to decide immediately after the report of the Additional Commissioner is available whether or not the prosecution of a railway servant is to be launched. When prosecution of someone other than a railway servant is to be launched, the police authorities will have to be consulted. If prosecution is decided upon the publication of the report may be withheld. But since in most cases prosecution may not be necessary most of the reports can be published soon after they are finalised. Such a step, we reiterate, will result in the public reposing greater confidence in the inquiries of the Commission.

616. Finally, to ensure the independence of the Commission and its officers, it is necessary that the entrants to the Commission understand clearly that once they opt for the Commission and are selected, they would not revert to Railway services. They should expect promotion within the Commission itself. At the same time, the Ministry of Railways should have no further say in regard to their career. We were told during the course of evidence that an Additional Commissioner whose post was upgraded

was not given the higher grade on the plea that the Ministry of Tourism and Civil Aviation wanted the Railway Board to certify that he was fit to become a Chief Engineer on the Railways. This, to our mind, is entirely wrong and undermines the independence of the officers of the Commission. Once a railway officer has been selected for the Commission, there should be no question of the controlling Ministry wanting his witness to be certified by the Railway Board for the purpose of getting the higher grade in the Commission or for any other purpose.

Commissions of Inquiry

617. The question of public confidence in the independence of the Commission is closely linked with the demands which are made time and again in Parliament and the Press for a 'judicial inquiry' whenever a serious accident takes place. We concede that at present a Commission of Inquiry presided over by a High Court Judge commands more confidence in the public mind than an inquiry by an Additional Commissioner. Nonetheless, we expect that if the steps that we have suggested for securing the independence of the Commission are taken, an inquiry by the Additional Commissioner will inspire sufficient public confidence. We may mention that in the United Kingdom there had been no judicial inquiry into a railway accident for almost 90 years until the inquiry into the Hixon Level Crossing accident in January, 1968. We feel that with the steps that we have suggested, a judicial inquiry on the Indian Railways too would, in course of time, become a rare thing. It is significant that though a number of Commissions of Inquiry inquired into railway accidents in this country, in two of the three cases where such Commissions of Inquiry were appointed after the Additional Commissioners had completed their inquiries, these inquiries endorsed the conclusions arrived at by the Additional Commissioners. In one case the Commission of Inquiry came to conclusions different from those of the Additional Commissioner but in that case eventually the Government accepted the findings of the Additional Commissioner and disagreed with the findings of the Commission of Inquiry. It may be mentioned that an inquiry under the Commissions of Inquiry Act is a fact-finding inquiry and like the conclusions of the Additional Commissioner, the conclusions of the Commission of Inquiry are not binding on the Government. Furthermore, an inquiry by an Additional Commissioner takes less time, is less expensive and is conducted by an officer who is conversant with railway working and is, therefore, at least in as good a position as a Commission of Inquiry in reaching a finding.

Personnel of the Commission and their status

618. We have already referred to the fact that the Commission at present consists of the Commissioner and five Additional Commissioners. A Deputy Commissioner assists the Commissioner generally in his work and also acts as leave reserve officer. Immediately after the reorganisation of the Railways in 1951-52 there were only six zonal Railways. The number of Railways has since gone up to nine and as a result each of the Additional Commissioners has generally two Railways to deal with except for the Additional Commissioner at Lucknow who deals with only one Railway namely the Northern Railway which incidentally is the biggest of all the zonal Railways.

619. We have already indicated that the Additional Commissioners of Railway Safety are unable to undertake the inspections required of them fully. The Kunzru Committee also had occasion to criticise the Additional Commissioners for not carrying out the inspections as required. Particularly, where one Additional Commissioner has to deal with two Railways,

it becomes difficult for him to carry out the inspections required in addition to his other duties. We have already alluded to the difficulties experienced by the Additional Commissioners in fitting their programme of inspections with the General Managers since such inspections on most Railways are concentrated in more or less the same period. We have also suggested in the earlier paras that in addition to accidents into which inquiries are obligatory, certain other accidents should also be inquired into by the Additional Commissioners. In order that the Additional Commissioners may carry out their work satisfactorily, it seems to us necessary that the strength of the Commission should be augmented by increasing the number of Additional Commissioners from five to seven. The jurisdiction of the various circles is a matter to be determined by the Commissioner in consultation with the Ministries concerned. Meanwhile, we suggest that the fifth circle referred to in para 586 which has hitherto been continuing on a temporary basis should be made permanent.

620. Recruitment to the post of Additional Commissioner is at present confined to civil engineers on the Railways. This narrows down the field of choice considerably and is, to some extent, responsible for the shortage of suitable volunteers. It would be, in our view, more advantageous to have a broader base of recruitment to the Commission. It may be mentioned that in their inquiries, the Additional Commissioners have to deal with problems which relate not only to civil engineering but also other aspects namely, mechanical, operating and signal engineering. It, therefore, seems to us that the field for recruitment to the Commission should be widened and there should be no bar to officers from other departments of the Railways being selected. We would of course like to add that the selection of officers should be in consultation with the Commissioner and no one should be taken into the Commission except on the recommendation of the Commissioner.

621. In order to attract suitable volunteers to the organisation, it is also necessary to build up a pyramid cadre so that the entrants can look forward to promotion in the same way as on the Railways. At present the five Additional Commissioners are all in the grade of Rs. 2,000—2,500. This grade should continue for five out of the seven Additional Commissioners which we have recommended for the reorganised set-up. The remaining two Additional Commissioners may be given a slightly lower grade namely Rs. 1,800—2,000 and the Deputy Commissioner may be in the grade Rs. 1,600—1,800. This would provide graded service in the organisation and should be an incentive to the railway officers to volunteer for service in the Commission. The recruitment should invariably be to the lowest of these grades and to none else. Volunteers should be invited from among officers in the Junior Administrative Grade. In the first selection consequent on the expansion of the department, this may, of course, have to be relaxed.

622. Further, once an officer has been selected for the Commission he should begin at the lowest grade available in the Commission, namely Rs. 1,600—1,800 and may from there go on to the higher grades. Their seniority should be counted from the date of service in the Commission itself so that an officer who joins the Commission earlier should be considered senior for promotion in the Commission to an officer who joins later, even though the latter may have longer service on the Railways. After an officer has joined the Commission there should be no question of any further selection as far as grades up to Rs. 2,000—2,500 are concerned. Promotions to these grades should go by seniority. The selection should be only for the post of Commissioner. This selection, too, should

be confined to the officers of the Commission and no outside railway officer should be imported for this purpose. We emphasized this not only so that the field of choice becomes wider and suitable and competent officers are willing to volunteer but also because in this way the independence of the officers of the Commission would be ensured.

623. The Kunzru Committee had recommended that the Commissioner of Railway Safety should have the same status and rank as that of a General Manager with an appropriate secretariat status. While agreeing that the Commissioner of Railway Safety should have the same status and rank as that of a General Manager, the Government did not agree to confer the appropriate secretariat status on the grounds that secretariat status is required only to perform certain functions on behalf of the President and that it was unnecessary to confer such status on the Commissioner of Railway Safety. We are afraid the recommendation seems to have been misunderstood by the Government. We are convinced that the Commissioner should have the appropriate secretariat status which in this case would be that of an Additional Secretary to the Government of India. Such a status would enable the Commissioner to have direct access to the Minister. As principal technical adviser to the Government in all matters concerning the Commission, he would thus be able to discharge his duties more effectively particularly where there are differences of opinion on any matters relating to safety between the Railway Board and the Commissioner. The differences, as already stated, should be resolved as far as possible by conference between the Commissioner and the Railway Board. If, however, the differences cannot be resolved at that level, the matter may have to be settled between the two Ministers concerned. For that it is essential that the Commissioner should be able to place his point of view before his Minister and to advise him appropriately and it is to enable him to do so effectively that we advocate conferring of the appropriate secretariat status.

624. We would also like to mention here that even though the Government had agreed that the Commissioner would have the rank and status of a General Manager, it is a matter of regret that when the salary of the General Managers was raised in September, 1965, the salary of the Commissioner was not correspondingly raised, as it should have been, at the same time. We recommend that this should be rectified without delay.

Location

625. The office of the Commissioner which was at Simla ever since May, 1941, was shifted to Meerut in October, 1963. From Meerut, the office was transferred to Lucknow in 1966 on the suggestion made by the Kunzru Committee in para 239(ii) of Part II of their Report. It was stated—

“We understand that it was originally intended that the Inspectorate should have its headquarters with the Communications Department and the Railway Board. The Inspectorate had, however, to be located at Simla and continues to function from there. Its transfer to New Delhi is not probably feasible for want of accommodation. We understand that the headquarters of the Research, Designs and Standards Organisation is to be located at Lucknow and we recommend that the headquarters of the Commission of Railway Safety should also be moved to Lucknow which, we consider, to be the best alternative to New Delhi.”

626. The Government accepted this recommendation and the office was transferred to Lucknow. At Lucknow, the office is housed about 7 miles from the station in a rented residential house lacking the facilities of an office.

627. We have been informed that a decision has since been taken by the Government to locate the office of the Commissioner at Secunderabad and the South Central Railway has been requested to make available accommodation for his office to the extent possible.

628. As for the circle offices of the Additional Commissioners, two are located at Calcutta, the third at Bombay, the fourth at Bangalore and the fifth at Lucknow. Thus while two of them are not at the headquarters of the zonal Railways, three are at the headquarters of the zonal Railways.

629. While we appreciate the considerations that led the Commissioner of Railway Safety to suggest a shift of the headquarters of the Commission to Secunderabad, it appears to us desirable that the offices of the Commissioner should be located at New Delhi. We may add that according to the Kunzru Committee too, the best place for the headquarters of the Commission was New Delhi. They, however, recommended Lucknow as the next best alternative because they thought it may not be feasible to find accommodation at New Delhi. To us, however, it seems that it should not be impossible for the Government to find accommodation for the office of the Commissioner in New Delhi.

630. The headquarters of the Additional Commissioners should be at the headquarters of the Zonal Railways except where the jurisdiction of the Additional Commissioner extended to more than one Railway in which case it should be at the headquarters of one or the other zonal Railway. This would provide liaison between the Railway administrations and the Commission which is to their mutual advantage. It must be appreciated that an Additional Commissioner can only be from one department of the Railways while in inquiries and even in other duties he may have to take the assistance of the other departments. Adequate office accommodation for them should be arranged on a priority basis particularly since the entire office establishment of these officers consists of one officer and a few men.

Annual Report

631. The recommendation of the Kunzru Committee that the annual report on the working of the Railway Inspectorate should be placed before Parliament had been accepted by the Government. We find that since 1963-64, the annual reports are being placed on the tables of both Houses of Parliament. This, in our opinion, is a salutary recommendation and should continue to be followed so that the Commission inspires the confidence of the public and Parliament.

CHAPTER XIV

THE RESEARCH, DESIGNS AND STANDARDS ORGANISATION AND ITS FUTURE ROLE

632. In Part I of our Report, we had referred to the growth of the Research, Designs and Standards Organisation during the five years following the Kunzru Committee Report and the good work which had been done by it during those years.

633. *Genesis*—It will be of interest to review the circumstances under which this highly important and increasingly useful organisation developed into its present form. The need for achieving a substantial degree of basic self-sufficiency in technology, design and know-how through applied research by harnessing the discoveries made by basic research to useful purposes was recognised fairly early, as far back as 1949. It was also realised that the Railways in India should profit by the lessons learnt by the railways abroad and by utilising the improvements in engineering and operating practices which the scientific institutions and individuals had made available to the Railways in the United Kingdom, Europe and America. As a consequence, preliminary discussions were held between the Railway Board, the Council of Scientific and Industrial Research and Sir Harold Hartley who happened to be visiting India as Chairman of British Airways. Sir Harold Hartley was an eminent scientist who had occupied, with great distinction, a Research Chair at Oxford and had helped the nationalised British Railways to set up what later on became the well-known Research Centre at Derby. The preliminary discussions were presided over by the Minister of Railways who was greatly impressed by the picture outlined at these talks. This helped in achieving further progress along the lines that were eventually adopted. The opportunities provided for follow-up meetings in the United Kingdom with Sir Harold Hartley, the British Railways' Executive, the Derby Research Centre, and the post-war research and development organisations being built up by the various continental railways gave further fillip to the progress of the scheme.

634. The decision that the RDSO should grow and function independently of the Council of Scientific and Industrial Research, while maintaining a close liaison and frequent interchange of ideas, was then taken. At the same time it was agreed that the RDSO should also keep itself in constant touch with the manufacturers of railway rolling stock and other equipment both in India and abroad, as well as with other operating developments found advantageous by foreign railways who were competing seriously with road transport and were, thus, forced to keep themselves on their toes and could not afford to ignore new techniques and improved practices.

635. In the early 1950s, the basic outlines drawn up for the RDSO highlighted three policy approaches. The first was to guard against placing those directing and guiding its activities in a position where they could not see the wood for the trees. This meant keeping the head of the organisation free of distracting functional preoccupation. The second was to make adequate provision for the interchange of new ideas and technological and operating advances between the Indian and foreign railways by

specifically providing for the import and study of the latest foreign railway innovations where they were likely to benefit railway operations in India. The third visualised that the RDSO would help the Railway to link know-how with know-why and thus assist in full appreciation, general acceptance and adaptation of innovations after suitable trials under Indian conditions before they were actually adopted.

636. The RDSO is thus an attempt on the part of the Indian Railways to have an integrated organisation in which technologists and research workers in the various branches of railway engineering concerned with the construction, maintenance and operation of the railways are brought together with the object of achieving the maximum efficiency and safety in train operation by coordinated research and development. The role of the RDSO covers many facets of activities which may be briefly summarised thus:—

- (i) to act as internal consultants to the Ministry of Railways and the zonal Railways and help them in solving the technical problems which may arise from time to time and in the modernisation of railway operations;
- (ii) to design and standardise the equipment used in the working of Railways with a view to achieving a high standard of efficiency and safety without sacrifice of economy in the use of available resources;
- (iii) to act as an observation post and a clearing house of knowledge and experience gained by the railways in advanced countries and to adapt them for use on the Indian Railways; and
- (iv) to undertake research and investigations for import substitution and for the development of indigenous industrial capacity for railway purposes.

637. The fulfilment of the role set out above involves processes of research and development on the one hand and of design, standardisation and manufacture on the other with a continual and intimate link between the two.

The present organisational structure

638. The RDSO, at present, consists of ten Directorates which dealt with:—

- (i) Research in Civil Engineering, Mechanical Engineering, Signal and telecommunication and Traffic Transportation.
- (ii) Civil Engineering, design and development.
- (iii) Architecture.
- (iv) Electrical Engineering, design and development.
- (v) O.H.E.—traction and installation.
- (vi) Carriage, design and development.
- (vii) Wagon, design and development and inspection of rolling stock and its components.
- (viii) Motive power, design and development.
- (ix) Signal and telecommunication, design and development.
- (x) Metallurgical and chemical engineering.

639. All these directorates and the various wings under them are located in Lucknow except for the Directorate of Metallurgical and chemical engineering which functions partly from Chittaranjan. A few officers who are in charge of liaison, inspection and development work are attached to the production units like the Chittaranjan Locomotive Works, Chittaranjan, the Integral Coach Factory, Perambur, the Heavy Electricals, Bhopal, the Tata Engineering and Locomotive Works, Jamshedpur and the Wheel and Axle Plant, Durgapur.

Research

640. The research activities of the RDSO are mainly of an 'applied' character and are directed mainly at securing solutions of problems connected with designing and standardisation of railway equipment and material, repairs and maintenance methods, etc. To that end, the research functions of the RDSO are complementary to its activities concerned with design development and techniques. The RDSO undertakes very little by way of fundamental research. We have been advised that whenever a problem of basic research comes up during the course of 'applied' research investigations, it is invariably remitted to one of the National Laboratories, research institutions or an Institute of Technology in the country. During the course of his evidence, the Director General, RDSO, told us that efforts of the Organisation in farming out problems of basic research to the National laboratories, Institutes of Technology or research institutions had not met with much success. Usually, such references evoked no response and eventually some of these problems had to be dropped after awaiting for a long time, in some cases five years or so. The Director General went on to say that in its research functions, the Organisation was equally keen to avoid duplication of effort and towards that end would like to make use of the fundamental research facilities available in the National laboratories and other institutions which were well equipped for this purpose. But unless the response of the latter was earnest and purposeful, there was little hope of any progress in this direction.

641. We are inclined to agree with the Director General in his appraisal of the prevailing state of affairs. During the course of our deliberations, we came across an instance in which on a relatively simple matter a reference had been made to a research institution by the RDSO. The RDSO was engaged in the development of a suitable reflective material for use on sighting boards. On certain aspects concerned with the development of this material, a reference was made to the Council of Scientific and Industrial Research, New Delhi, who coordinate development work in such matters. The Council of Scientific and Industrial Research in turn asked the Indian Institute of Technology, Kanpur, to study the problem and to send a project proposal for investigation to the RDSO. The matter remained under study by the Indian Institute of Technology, Kanpur, who it appears prepared a project in about two years' time. The stage of development of the required material is yet nowhere near finality. This case is illustrative of the halting manner in which the RDSO receive response from the research institutions.

642. While we are at one with the policy adopted that duplication of effort should be avoided wherever possible and the problems of basic research should be farmed out to the National research institutions which are not only excellently equipped but also the best suited for research in

such problems, the need for a purposeful dialogue and for resoluteness and promptitude in dealing with reference made by the RDSO and other similar institutions needs no emphasis. We would suggest that with a view to obtaining better coordination with the fundamental research institutions, laboratories and institutes of technology, the Director General, RDSO, or his representative should be, in an ex-officio capacity, on the governing council of those of the National laboratories and institutes on whom the RDSO has to lean heavily for the solution of its basic research problems. We understand that representatives of some of these institutions and laboratories are members of the Central Board of Railway Research. The proposal which we are making would thus be only a reciprocation of the arrangements already existing and would go a long way in effecting close and continuous coordination and in evoking prompter response from these laboratories and institutions in finding solutions to problems framed out to them by the RDSO.

643. Relieved of fundamental research problems, the RDSO would thus be in a position to concentrate on problems of applied research. Applied research may refer to the evolving of ways and means to improve the existing equipment and services or developing of new forms or systems. In either of these objectives, the criteria which should dominate the RDSO's outlook should be the significance of the problem and the urgency with which a solution has to be found. There are problems which by their very nature are such as would take a long time to work out. On the other hand, there are problems which cry for an immediate solution. We consider that in the matter of applied research, priority should, for some time to come, be given to problems which are susceptible of at least a partial solution within a period of two to three years over the relative long-term research projects. We find, for instance, that studies and research on the question of vertical and lateral strength of track have been in progress in the RDSO over the last five or six years and yet the study remains incomplete and may continue for some more time. Similarly, we find that the question of track tolerances has been under consideration for several years and has to be continued and expanded further. It is, in our view, inexpedient that such long term projects should impede the investigations for finding solutions to current difficulties which may before long become emergencies.

644. A conspicuous example of a problem needing immediate solution is the designing and standardisation of signalling relays on which modern signalling depends so much and which are essential for progressing such works. We find that at present numerous types of relays are being imported from different countries. Their designs differ from each other necessitating maintenance of large stocks of spares. A beginning has been made by setting up a Relays Cell in the RDSO but we consider it necessary to accelerate the pace considerably so that relays suitable for our purpose and using indigenous materials to the maximum extent can be developed. The different types of relays of foreign design, at present being installed, may no longer be in production in the countries from which they were imported when time comes for their replacement. The difficulties may then become insurmountable. It is in this context that we stress the need for identifying long term projects from those which are not only amenable to solution within a short time but are also more urgent.

645. This brings us to the question of trying out under operating conditions prevailing in this country, the new and improved engineering and operating practices which have proved of advantage in other countries with such local modifications as may appear necessary in our conditions. In such practical adaptive research, a careful judgement and a high order of expertise are essential to make the best use of the patterns and results of research abroad. While advantage may be taken of the knowledge and experience gained by the railways in other countries, it may not always be possible to adapt foreign devices in toto in local conditions. This task of adapting what has been tried elsewhere with suitable innovations to suit our requirements is indeed a challenging one. Through the international contacts which the Indian Railways and the RDSO are maintaining, it should not be difficult to obtain detailed information of various specifications including costs and performance results and thereafter, with methods of trial and error research which have become a well recognised approach in America, Europe and Japan, to modulate such innovations for our own use. Among the advantages of this method are the comparatively low costs, less time in reaching useful conclusions, visible results and the easier carrying of conviction to the zonal Railways.

646. *Operations research*—The potential benefits of operations research and the advantages which other countries, where the problems are not dissimilar, have derived from such research are known sufficiently well. Though we have been told that the RDSO is applying the principles of operations research in its various investigations, we cannot help remarking that very little is being done in this direction in an organised manner or is programmed for the future. Whatever little has been accomplished is by way of analytical studies of specific problems conducted on the local initiative of some enterprising senior railway executives. What is, however, needed is that in matters of railway operation and maintenance, research should be conducted into the practices obtaining on the zonal Railways in various spheres of operation in order to arrive at the near-ideal methods of operation and maintenance under varying conditions. It would also, in our opinion, be useful to make a quantitative assessment of where and what safety facilities should be provided on the various Railways and to what extent safety could be improved by doing so. An analysis of data such as the location of accidents, conditions of trains, human and other factors and the facilities provided on each of the Railways may yield useful clues as to the relationship between the prevention of accidents and the safety facilities provided and may be indicative of the standard of safety facilities required. Such studies, we find have been conducted on the Japanese Railways with advantage. If the ultimate objective of the research organisation is to maximise efficiency, safety and long-term economy, greater reliance will have, in future, to be placed on methods of operations research.

Design

647. The entire research and testing activity is ultimately aimed at developing new ideas and concepts so that equipment of a suitable design and practices which facilitate, and lower the cost of operation and maintenance and maximise efficiency of each component of rolling stock, permanent way and signalling system can be evolved. In short, research furnishes data for absorption by the design wings.

648. We have been advised that a large number of machines for use in the mechanical engineering research and development laboratory, such as the shock absorber testing machine, the abrasion resisting testing machine and the rolling load fatigue testing machines, etc. have been designed by the RDSO and manufactured in the railway workshops using indigenous materials. We would like to commend these efforts. We would also like to add that designing and development of machines for special purposes which cannot be purchased as off-the-shelf items from the trade should be a continuous activity.

649. Such special purpose machines can at best be viewed only as a means to achieving more purposeful ends, namely, improved designs of components of locomotives and rolling stock. For this purpose, adequately equipped sections of the RDSO should, in our view, be located at the manufacturing units like the Locomotive Works at Chittaranjan, the Integral Coach Factory at Perambur and the Diesel Locomotive Works at Varanasi. Efforts should also be made to attract the best Indian talent for design work from all sources and to encourage the designing of improved jigs and tools for railway workshops and the better planning of equipment and plant layout for workshops, loco sheds, sicklines, stations, etc. When we say this, we have in view the specialist consultancy service which the RDSO should provide in the designing and equipment of such depots. It is not our intention that the Design Wing of the RDSO should function as a general-purpose drawing office at the beck and call of the Railways and we would like the RDSO to guard against this.

Standards

650. Standardisation is a vital function of the RDSO and with the many varying and rapidly growing demands, it acquires increasingly greater importance. We consider it useful that some sections of this Wing of the RDSO should be located in the Railway Board so that complete sets of standard specifications and drawings can be readily available on demand and references regarding these can be disposed of speedily. We would also suggest that the expert technical Standards Committees should invite representatives of the Commission of Railway Safety and some manufacturers of railway equipment on a selective basis to participate in their deliberations so that the viewpoint of the latter can be taken into account and at the same time the representatives of the Commission of Railway Safety and of manufacturers keep in touch with the thinking of such Standards Committees.

Signalling and telecommunications

651. What was contained in the preceding paragraphs was intended to convey an overall idea of the directions in which the activities of the RDSO should be channelled. We would, however, like to bring into sharp focus the rapid progress being made by advanced countries in the development of signalling and telecommunication, particularly the use of such items as axle counters, train describers, hot axle detectors, electronic track circuits and automation in marshalling yards, improved communication methods like message dialling and microwave. It has been represented to us that adequate attention has not been paid to investigating problems concerned with signalling and telecommunication peculiar to the Railways or to strengthening the telecommunications network on the railway system. We feel that there is great scope and urgent need for work of this nature in the RDSO and we would urge that this receives its due share of attention.

Checks and inspections

652. In part I of our Report we had stated that the RDSO need not carry out test checks on the quality of maintenance and standard of manufacture of railway equipment on the Railways. We would, however, like to make an exception in the case of tests and inspections which are made by the RDSO at the specific request of the zonal Railways, the Railway Board or the Commission of Railway Safety. It occurs to us that references from these authorities may be more and more frequent in future. We would, therefore, suggest that a suitable organisation may be created in the RDSO so that such requests can be dealt with without causing interference and interruption in the other regular approved programmes of the RDSO. We would also like to add that what we had stated in part I of our Report does not apply to the production units where the officers of the RDSO are already posted for carrying out inspections. Similarly, the inspection of material manufactured in the signal and telecommunications workshops should, in order to ensure uniform quality, be entrusted to the RDSO. We understand that the inspection of electrical signalling equipment manufactured by the various firms is already undertaken by the RDSO, but only a small percentage of production is inspected as a test check. This would have been adequate if the signalling industry had been long established in the manufacture of sophisticated signalling equipment and had its own research and inspection units. In the present state of development when a number of firms are entering the field and when those already in the field are taking to new items, it is essential that a much larger proportion of electrical signalling equipment is inspected both at the manufacturing stage and at the assembly stage. The inspection organisation of RDSO should, if required, be suitably strengthened to perform these essential functions. It appears to us that the inspection units could with advantage be located at Calcutta, Bombay, Madras etc.

Consultancy functions

653. Side by side with its functions as consultants to the Railway Board and the zonal Railways in respect of engineering and operating problems, the RDSO have also, we are advised, been acting as consultants to the State Trading Corporation and the wagon building industry. We would like to commend the RDSO on this expanding role and would urge that technical consultations should be provided in full measure to these important clients. We would also suggest that such consultation as may be asked for by the Commission of Railway Safety should be made readily available.

654. We are told that the RDSO's credit as potential consultants to the railways in developing countries is very high. We consider that with the expanding band of competent officers and staff and with the growing knowledge and expertise which the RDSO is steadily acquiring, rendering of consultancy services by the RDSO would progressively increase and more and more confidence will be placed in its technical advice.

Future development

655. We consulted the two Directors General of the RDSO who were successively in charge of the RDSO during the time this Committee was functioning. They were good enough to indicate the various projects on which research may in future have to be carried out as also the directions and the extent to which the various directorates in the organisation should

be strengthened. We do not consider ourselves competent to spell out details of projects to which the RDSO should apply itself in future and consider that this is a matter which would have to be left to the RDSO under the guidance of the Railway Board and the Central Board of Railway Research keeping in view the requirements and priorities which may arise from time to time. A few subjects whose urgency strikes us as pressing, we would like to mention in passing. With the increased speeds of rolling stock and the introduction of fast non-stop trains the subject of vehicle dynamics has assumed great importance. Research on the various aspects or riding quality of rolling stock from the viewpoint of both safety and comfort as also stress analysis on vehicle structures and important components would have to be pursued and, if necessary, expanded. This research must be suitably dovetailed into a wide-range study of derailments to establish guidelines for designs and maintenance practices which are conducive to greater safety. Similarly, the problem of seizure of roller bearings in fast non-stop trains particularly when the conventional method of station staff watching out for an overheated axle box from the station platform is no longer applicable appears to call for an urgent study and solution. We have referred to the incidence of seizure of roller bearings elsewhere. Here we would like to emphasise the need for evolving a suitable device whereby the driver in the cab gets a timely warning of the malfunctioning wheel. One or two other matters requiring study and research we have already mentioned in an earlier chapter. These were the need for research and development of a self-propelled ultrasonic rail inspection car for detection of rail flaws and the study of the problem of safe speed on turn-outs of varying degrees to ascertain the stage at which dangerous conditions are liable to occur and to lay down limits of safe speed. These, in our view, would be fruitful fields for research by the RDSO.

656. We would refrain from indicating the directions and the extent to which the various directorates and wings of the RDSO should be strengthened. We have, however, no doubt that expansion of the RDSO would be necessary so that the RDSO is able to play the role assigned to it.

657. It would also, in our view, be necessary to synchronise the expansion of the RDSO with the corresponding expansion in its basic physical requirements. These include acquisition of land, provision of office and laboratory accommodation, residential accommodation, water and electric supply, sanitary and medical facilities, recreational facilities, etc. The expenditure for provision of basic requirements should be distinct from the working expenses of the RDSO to which we refer in the following paragraphs.

658. *Equipment.* In the course of his evidence before us, the Director General, RDSO, indicated the equipment required by the Organisation in the next five years on considerations of a higher standard of safety in train operation. A list of this equipment given by the Director General, RDSO, is shown in Annexure XII. We are advised that the RDSO is in need of some very important equipment like the measuring wheel and other telemetric devices, track recording-cum-research-car, pulsator with hydraulic jack and test bench for fatigue testing, eddy current testing equipment, measuring instruments for signal and telecommunications equipment, etc. We see no reason why the work in the RDSO should suffer for want of necessary equipment and would suggest that procurement of equipment should be planned so as to meet effectively the needs of the RDSO.

659. Finance--The budget allotment for the RDSO for the year 1969-70 amounts to Rs. 2.45 crores which works out to about 0.33 per cent of the gross ordinary working expenses of the Indian Railways. It is expected that with the expansion envisaged in the foregoing paragraphs the budget of the RDSO may go upto about Rs. 5 crores annually in the course of the next few years. This would be approximately 0.66 per cent of the gross working expenses. This increase in expenditure in the course of the next few years, would, in our view, be amply justified and would be repaid in the form of higher standard of earnings, efficiency, and safety in railway operation.

660. We would like to add that allotment of foreign exchange would have to be an essential part of the budget allotment for the RDSO if its activities are not to be hampered. It has been indicated to us that for the proposed future annual expenditure of Rs. 5 crores, it will be necessary to allocate about Rs. 1 crore in foreign exchange for the procurement of equipment, training of personnel and acquisition of literature from abroad. This may denote a substantial increase in the allotment of foreign exchange as compared to the previous year. We would strongly urge that foreign exchange needed for the expansion of the RDSO should be released as and when required.

661. Reorganisation of the RDSO--It is our opinion that the re organisation of the RDSO required to fulfil the role suggested in the foregoing paragraphs should be carried out within one year so that the maximum advantage can be derived from this organisation towards achieving safer and more efficient operation. The RDSO should be developed as a self-contained and expert body of high technological calibre. For an organisation of this nature to be successful, there should be excellence not only at the top but at each echelon of the heirarchy and the effort should be to induct the most suitable officers and staff at all levels with suitable motivating environment. It is, therefore, obvious that the RDSO's rules of business and the yardsticks in respect of its staff, equipment and materials, financial powers, etc., may have to be different from those which are applicable ordinarily to the Railway administrations. To ensure that there are no hold-ups or handicaps to progress anywhere in the organisation, the overall head of the RDSO should be the Chairman of the Railway Board to whom the Director General should report direct. Finally, the Director General who is the functional head should appropriately be selected from amongst the experienced General Managers with a flair for research. We had suggested in Part I of our Report that the head of the RDSO should have a long enough tenure to make an impact on the organisation. If this involves a still higher grade for the post temporarily to enable the incumbent to continue, the upgrading would, in our view be justified.

CHAPTER XV

ACCIDENT STATISTICS

662. The statistics of accidents on the Indian Railways are published by the Railway Board in Statement 41 of the Supplement to its Annual Report on Indian Railways. A mass of data is tabulated in this statement, the accidents on the open line being divided under three broad heads, namely, train accidents, failure of railway equipment and miscellaneous. Train accidents include train collisions, train derailments, fires including explosions in trains and accidents at level crossings. Train derailments in mid-section and within station limits and train accidents at manned and unmanned level crossings are shown separately.

663. *Diagnosis-oriented statistics*—In order that statistics of train accidents may be of use, it is important that they should identify at least broadly, the primary causes of the various types of train accidents. Only then can the administration's attention get focussed on the various basic causes which give rise to accidents. Instead, unfortunately, we find that the statistics of train accidents as compiled in Statement 41 of the Supplement at present are oriented only towards their number and consequences. Train accidents are split up numerically according to classes, i.e., collisions, derailments, fires in trains, level crossing accidents, indicating separately how many were reported to the local Government, how many were inquired into by the Additional Commissioner of Railway Safety and their consequences, that is, total number of passengers and others killed or injured and the approximate cost of damage and interruption to through communication. There is no indication in this mass of statistics as to how many of them were attributable to human element, technical defects or other causes.

664. In the statistics of failure of railway equipment in the same Statement, of course, some effort at indicating the causes is discernible. Even here the failures of engines due to faulty design, material or workmanship in the mechanical department are lumped together. Similarly failures due to faulty material, workmanship or operation arising from the working of running staff are also lumped together. In respect of train accidents, however, no cause-wise analysis is attempted in the Supplement. Even the Manual of Statistical Instructions merely stresses that statistics of train accidents should include the number and 'results' of accidents and it makes no mention of causes.

665. We may mention that a small pamphlet entitled "A Review of Accidents on Indian Government Railways" which is published annually by the Railway Board, attempts an elementary analysis of causes of train accidents under certain broad heads like 'failure of railway staff', 'failure of equipment—mechanical, track and electrical', 'sabotage', 'accidental' and 'cause not established'. This analysis is confined to two categories of accidents, namely, collisions and derailments.

666. While even broad heads of causes may have some value, the statistics of train accidents to be of intrinsic value should, in our opinion, itemise these broad heads further. For instance, statistics of accidents ascribable to failure of the human element should be further sub-classified under failure of station staff, failure of train crew, i.e., engine crew and

guard and failure of other staff. Similarly, technical defects should be further itemised under locomotive and electric multiple unit defects, carriage and wagon defects, track defects, signalling apparatus defects, electrical defects, defects in other structures and combined defects. Even under the residual head 'Accidental' or 'other causes', there would be considerable scope for useful itemisation particularly in regard to derailments. Train accidents in respect of trains driven by diesel and electric locomotives could, usefully, be given separate treatment since conditions under such traction vary substantially and useful conclusions can be drawn from a causewise analysis. Similarly automatic signalling has its own special features and accidents on these sections may be analysed separately with respect to their causes. We do not intend here to give an exhaustive tabulation of heads under which statistics of train accidents should be split up but merely to indicate the direction in which the compilation should be oriented so as to be of value to the administration.

667. *Uniform basis of compilation of statistics*—During the course of analysis of train accidents which we attempted we observed that the conception and basis of compilation of statistics of train accidents was not identical on all the Railways. For instance, derailments at outlying sidings were treated as station derailments by one Railway and mid-section derailments by others. Collisions due to reception of trains on lines fouled by vehicles on adjacent line or lines or due to failure of station staff to put back signals to 'on' after the arrival of the preceding train were classified as collisions attributable to miscellaneous causes by some Railways instead of failure of station staff. We would suggest that accidents statistics under different heads should not only be clearly indicative of the basic causes but should be compiled on all the Railways on a uniform basis and instructions which leave no room for ambiguity should be issued to all the zonal Railways.

668. *Streamlining the classification*—During the course of our statistical study of accidents we observed that causes of fires on diesel or electric locomotives are being treated as train accidents on Railways. This factor, in our view, is likely to deflect the attention of Railways from the real nature of the occurrence. Fires in diesel or electric locomotives are more in the nature of engine failures than accidents to trains, and a more accurate indication of the nature of such occurrence could be given if they could be brought under the broad head 'failure of railway equipment'. Fires in trains should, in our view, encompass cases of fires in vehicles and wagons only. If necessary, fires in electric and diesel locomotives may be brought under a separate sub-head under the general head 'engine failures' to isolate them from the mass of figures included under 'engine failures'. Such a course would, in our view, direct pointed attention to cases of fires in electric and diesel locomotives.

669. We also notice that time failures of engines under the broad head 'failure of railway equipment' are reckoned on the basis of delays of one hour or more caused to trains due to malfunctioning of locomotives. While such standards may have been all right for steam traction years ago, we consider them inapt in the present day conditions, particularly, in case of diesel and electric locomotives whose efficiency index must be very different and for which a much shorter duration should, in our view, be prescribed. In any event we do not see why in this respect the performance of steam, diesel and electric locomotives or their handling by drivers should be compared on the same basis.

670. We also notice that at present 'failure of railway equipment' includes only failures of rolling stock, permanent way and overhead electric wires. Failures of signalling apparatus are not included under this head. The effect of a breakdown of signalling installation, as for instance in a yard equipped with route relay interlocking or in a centralised traffic control or automatic signalling territory is heavy delays in train running if not a complete stoppage of movement. Similarly, a total failure of communications on a section can paralyse train running. We, therefore, suggest that a breakdown of modern signalling installations or means of communications may also be classified under the head 'failure of railway equipment'. We might point out that on the Japanese National Railways, power transmission failures, block instrument failures, signal and interlocking failure are classified as accidents. While we do not suggest going that far, we do consider that breakdown of signalling apparatus should be included under the head 'failures of railway equipment'.

671. We also consider that accident statistics compiled at any time should be examined periodically to assess their value. If some of them no longer have utility from the viewpoint of management to enable them to initiate remedial action to enhance safety, they should be deleted. Contrarywise, new statistics which may help in formulating measures for securing increased element of safety of railway operation may be introduced. In other words, the role of statistics should be essentially such as can assist the administration in aiming at improving the service rather than a mass of figures which can at best have only an academic interest.



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CHAPTER XVI

SAFETY ORGANISATION

672. We had briefly touched on the safety organisation in Part I of our Report and had stated that we proposed to examine the working of the organisation further. During the course of our tours we had opportunity to discuss the role and the functioning of the organisation with officers at all levels. We were also able to discuss the subject at length with the Railway Board.

673. Safety to have a permanent effect must be built into the working of the Railways. In the final analysis safety depends on the staff in each department of the Railways and on everyone doing his work conscientiously and properly. An accident generally speaking is nothing but a breakdown in efficiency. It is necessary to emphasise this in order that the role of the safety organisation may be seen in proper perspective.

674. The four important departments concerned with safety of rail travel are the operating, the mechanical engineering, the signal engineering and the civil engineering departments. In order that rail travel may be safe, it is necessary that each department should do its bit in the best possible manner. The civil engineering department must see that the track is maintained in the best possible condition so that there is no likelihood of derailment through defects in track. The mechanical department must see that the locomotives as well as carriages in which the public travel and the wagons in which goods are moved are well maintained and in perfect fettle, since defects in maintenance of rolling stock can lead to accidents. Similarly the signal engineering department must see that its equipment whether operated mechanically or controlled automatically functions properly. Lastly, the department responsible for transportation which is the end product of all railway activity must take care that train movement takes place according to rules as trains pass from one station to another.

675. Since safety must depend on each department working properly in its own sphere and in coordination with the others, it follows that safety in rail travel cannot be achieved by merely super-imposing a separate safety organisation on other departments. That is of course not to say that some provision may not be necessary for inculcating safety consciousness in the staff of the various departments concerned with the movement of trains.

676. Until the time the Kunzru Committee made its recommendations there was no separate safety organisation on the Railways even though there were safety cells working in the Railway Board and the Headquarters of each zonal Railway. The main function of these cells, however, was to analyse the causes of accidents so that the factors responsible for accidents could be identified and remedial measures taken. This work was, more or less, in the nature of a study and analysis of causes of accidents and finding ways and means of eliminating them. The safety organisation which was set up after the Kunzru Committee's report had somewhat different objectives. In the first part of their report that Committee had suggested the creation of an ad hoc organisation which would fit into the framework then existing for the purpose of an integrated implementation of their

recommendations in the matter of safety of rail travel. This ad hoc organisation was to be set up at various levels from the Railway Board down to the divisional or the district level. It may be mentioned that at that time two of the Railways did not have divisional organisation. Since then both these Railways have been brought under the divisional system.

677. The general set-up of the safety organisation which was created in pursuance of the recommendations of the Kunzru Committee and which exists at present is broadly this. In the Railway Board's Office there is a Safety Directorate under the charge of a Director. Originally there was also a Joint Director in this Directorate but later this post was abolished as an economy measure. On the zonal Railways the safety organisation was placed under a special officer designated as Transportation Superintendent (Safety). Until recently this post was in the Intermediate Administrative Grade on all but three Railways where it was in the Junior Administrative Grade. Since then uniformity has been brought about and at present, these posts are all in the same grade, namely, the Intermediate Administrative Grade. At the divisional level, Safety Officers were appointed—some of them in senior scale and others in junior scale. Very few of the posts of Safety Officers, it appears, however, were new creations as by and large the posts of Divisional Operating Superintendent (General) on most of the divisions and of Assistant Operating Superintendent (General) on some of the divisions were redesignated as Divisional Safety Officer in the senior scale or the junior scale as the case may be. Attached to these Divisional Safety Officers on each division was a team of specially selected Safety Counsellors drawn from the transportation, the mechanical engineering and the civil engineering departments to assist the Safety Officer in his work. Generally speaking four Safety Counsellors were attached to a Divisional Safety Officer, namely, a loco inspector, a carriage and wagon inspector, a permanent way inspector and a transportation inspector. On some divisions there were only three Safety Counsellors, either the carriage and wagon inspector or the permanent way inspector being dropped. The team of Safety Counsellors did not include any staff from the signal engineering department.

678. The main function of Safety Counsellors as visualised by the Kunzru Committee was to make personalised contacts with and educate the staff of the various departments in the observance of safety rules. They were required to give talks on safety matters and to hold meetings of the staff in their respective jurisdiction. In addition they were also required to carry out inspections of an intensive nature from a safety angle.

679. Apart from the duties mentioned above the safety organisation undertook propaganda drives by means of posters, safety camps and so on for the purpose of inculcating safety consciousness in the staff concerned with the movement of trains.

680. The Kunzru Committee, it may be mentioned, considered again in Part II of their Report the subject of safety organisation which had in the meantime been set up. In this part of their Report the Kunzru Committee apparently took the view that so far as the organisation in the Railway Board and the zonal Railway Headquarters was concerned, it should be made permanent and where necessary, strengthened. As to the divisional organisation, it was recognised by that Committee that the responsibility for safe maintenance of track, rolling stock and signalling and interlocking apparatus rested with the respective departmental officers. In

their view the function of the safety organisation at the divisional level was to consist in dealing with accidents, arranging inquiries, implementing recommendations and taking preventive measures in this behalf. The Kunzru Committee were of the view that the responsibility for safety education and supervision should devolve on the supervisors of the different departments and multiplicity of inspections as a permanent measure was not conducive to effective supervision. They, therefore, thought that the Safety Counsellors whom they had suggested in Part I of their Report as an *ad hoc* arrangement should be absorbed in the respective cadres of their department. In other words the Kunzru Committee did not visualise that Safety Counsellors would be a permanent feature of the safety organisation.

681. We had pointed out in Part I of our Report that there had been a significant fall in the number of train accidents in practically all categories. This tendency continued in the year 1968-69 as can be seen from the following table :—

Serial No.	Category	Years						
		1962- 63	1963- 64	1964- 65	1965- 66	1966- 67	1967- 68	1968- 69
1	Collisions	..	98	93	81	74	67	66
2	Derailments	..	1,316	1,300	1,035	962	876	892
3	Level crossing accidents	168	161	146	123	104	111	129
4	Fires in trains	..	55	81	31	42	50	42
	Total	..	1,637	1,635	1,293	1,201	1,097	1,111
								906

682. It would be seen that there has been a fall of 44 per cent during the last six years and the number during the latest year was the lowest. For this satisfactory performance the credit of course must go not only to the safety organisation but to all categories of railway staff including officers, supervisors and railwaymen of all departments. It is due to the devoted and conscientious labour of all categories of railway staff and to the technological aids introduced that this reduction in the number of accidents has been possible. Nonetheless, it is clear that the safety organisation has played a vital role in enhancing the element of safety in rail travel by instilling safety consciousness among staff and eradicating short cut methods which jeopardise safety.

683. It is in the light of these observations that we are called upon to express our views on the future of the safety organisation and to indicate what changes, if any, are necessary to make it an effective means of enhancing safety. We have already referred to the fact that the safety organisation is in three tiers, namely (1) at the level of the Railway Board, (2) at the level of zonal Railway headquarters, and (3) at the divisional level.

684. So far as the level of the Railway Board is concerned we are of the view that the Directorate of Safety has a useful function to perform inasmuch as it focuses attention at the highest level on matters having a bearing on safety. Analysis of long-term trends of accidents, examination of various suggestions and recommendations to promote safety and following up the implementation of the recommendations coupled with on-the-spot checks to see whether short cut methods are being adopted and how these can be eschewed are, indeed, highly useful functions. We, therefore consider that the Directorate of Safety should continue to perform these

functions as a permanent measure. We are, however, disappointed to note that the post of the Joint Director in the Directorate of Safety was abolished some time ago for reasons of economy. This post had been created primarily so that at all times the Director or the Joint Director could go out on inspection and the two officers could take turns. The main objective of having a Joint Director in addition to a Director was that the Directorate should be able to see through field inspections that safety work is carried on by the Railways on the right lines. As a retired Chairman of the Railway Board pointed out it is necessary that effective supervision should be exercised over the working of the safety organisation on the Railways. To use his own words, "It is essential to see whether the Railways are really doing what they are supposed to do and what they are reporting". We consider this objective unexceptionable and would strongly recommend that the post of Joint Director in the Safety Directorate should be revived. Considerations of economy should not, in our opinion, stand in the way where safety is concerned.

685. The next tier of the safety organisation is at the zonal Railway headquarters. As stated earlier, the Transportation Superintendent (Safety) on each zonal Railway is an officer from the Operating Department in the Intermediate Administrative Grade. The evidence which was tendered before us during the course of our tours showed that the Transportation Superintendent (Safety) has a lot of office work on account of which he is unable to find enough time to go out on line as often as he should. That the Transportation Superintendent (Safety) should spend a good deal of his time in inspections from a safety angle goes without saying. At the same time we think that to keep in touch with the actual trend in accidents and other safety measures which are evolved from time to time either on the basis of accident inquiries or of other sources, he should not be isolated from case work dealing with accidents. We would, therefore, suggest that the headquarters safety organisation which is headed by the Transportation Superintendent (Safety) may be strengthened, where required, by the appointment of an officer in the senior scale who would help the Transportation Superintendent (Safety) both in inspections as also in routine case work dealing with accidents.

686. Finally, we come to the organisation at the divisional level. As we have pointed out earlier the Divisional Safety Officer on many of the divisions is in the senior scale but in some the officer is an assistant officer who looks after safety work under the overall control of the Divisional Operating Superintendent. As already indicated, except for a few posts of Divisional Safety Officer which were created either in the senior scale or in the junior scale in pursuance of the recommendations of the Kunzru Committee, by and large the posts of Divisional Operating Superintendent (General) where they existed or of Assistant Operating Superintendent (General) had been redesignated as those of Divisional Safety Officer. These officers were assigned extra duties concerned with education of staff in safety matters, personalised contact with staff, issue of posters, leaflets and other propaganda material in addition to the duties which they used to perform as Divisional Operating Superintendent (General) or Assistant Operating Superintendent (General).

687. The duties of each of these Divisional Safety Officers whether they are in senior scale or junior scale are more or less identical. A Divisional Safety Officer in the junior scale, however, besides being unable to pull his

weight with his colleagues in other departments is unable to relieve the Divisional Operating Superintendent of the workload in the same manner as an officer in the senior scale would. For a Divisional Safety Officer to be able to carry weight with his counterparts like the Divisional Mechanical Engineer and the Divisional Civil Engineer and to take a purposeful part in the safety meetings and discussions which are held at the divisional level, we consider it essential that the officer should have the same status as the other officers he has to deal with. We are of the opinion that the system in this regard should be uniform and the Divisional Safety Officer in each of the divisions should be in the senior scale. Wherever the post is held at present by an assistant officer, it should be upgraded. We might add that whichever division we visited during the course of our tours, the evidence of the Divisional Superintendents was unanimous that the Divisional Safety Officer should be in the senior scale.

688. *Position of Safety Counsellors*—Finally we come to the part of the divisional safety organisation which consists of Safety Counsellors. These Safety Counsellors, as stated earlier, come from the transportation, the mechanical and the civil engineering departments. On the question whether the Safety Counsellors from different departments should continue to function under the Divisional Safety Officers, we found considerable diversity of opinion. The majority of witnesses who gave evidence before us on this subject held the view that the present arrangement whereby Safety Counsellors from various departments are placed under the Divisional Safety Officer is efficacious and should continue as at present. It was argued that if the Safety Counsellors from the mechanical and the civil engineering departments were to be reverted to their parent departments, there was danger of their being utilised for general purposes rather than specifically for safety matters. It was also stated that safety is an integral matter in which various departments are concerned and it is, therefore, necessary that the team of Safety Counsellors consisting of representatives of various departments should function one and any spot checks and inspections which they make should be made as a team. As against this, some witnesses held the view that the time has now come to carry out the intention of the Kunzru Committee to revert the Safety Counsellors to their respective departmental cadres. One Railway expressed the view that in the course of the last six years, Safety Counsellors have become another inspectorial organisation over and above the normal supervisory staff. This development, according to this Railway, has resulted in the normal supervisory staff feeling less responsible for ensuring that unsafe practices are eradicated. This Railway, therefore, felt that Safety Counsellors should not be allowed to continue as at present and that the responsibility of ensuring safety should once again be put squarely on the shoulders of the departments concerned.

689. It seems to us that there is a good deal of force in the opinion expressed by this Railway. As we have indicated, safety is not something, which can be imposed by an outside organisation. It must be built into the various departments of the organisation itself and particularly in the departments mainly concerned with movement of trains. Furthermore, there was some evidence to show that when defects are pointed out by Safety Counsellors in the work of departmental supervisors who are of the same rank and at times even senior, the present arrangement becomes a source of resentment. When such a feeling is generated in the department concerned, the department is disposed not to take a serious view of the

defects pointed out by the Safety Counsellors. Besides, the Divisional Safety Officer, being an Operating Officer, is not always in a position to evaluate the usefulness of what the Safety Counsellors of other departments under his control may point out and ordinarily all that he does is to forward the observations of the Safety Counsellors to the divisional officers of the departments concerned. Such references at times create friction and inter-departmental difficulties which have to be resolved at the level of the Divisional Superintendent.

690. Taking into consideration all these difficulties, we are of the view that the Safety Counsellors of the departments other than transportation should be sent back to their parent departments. This we feel would not only be in conformity with what the Kunzru Committee had visualised but would be a step in the right direction and in the best interests of the Railway administration. When, however, we say that the Safety Counsellors should go back to their respective departments we do not mean that they should cease to carry on their present function of promoting safety. Our intention is that the Safety Counsellors of departments like the mechanical engineering and the civil engineering on being sent back to their parent departments should continue to carry on their present functions though under the supervision of their respective divisional officers. If this is done, not only will the Safety Counsellors be able to continue to play their useful role—perhaps more so—but at the same time the friction which the present arrangement engenders would disappear. At the same time there would be no obscurity left that the responsibility for ensuring safe practices rests with the departments concerned.

691. We would also suggest for the consideration of the Railway administrations that when the Safety Counsellors are reverted to their parent departments, posts of Chief Permanent Way Inspector, Chief Loco Inspector, Chief Carriage and Wagon Inspector and Chief Transportation Inspector should be created in lieu of the existing posts of Safety Counsellors on each division. The functions of these Chief Inspectors should be to carry on the work of safety by educating the staff in correct methods of working, propagating the importance of safety by mass communication methods and reporting to their divisional heads about any defects found by them during the course of their checks on the line which jeopardise safety. These posts, in our view, should be in Class II. With a higher status and rank for these Chief Inspectors there should be hardly any feeling of resentment among the senior supervisory staff whose work is commented upon. Moreover, with higher status the Chief Inspectors would be in a position to deal effectively with defects found during their inspections. The Chief Transportation Inspector would, of course, continue to function under the Divisional Safety Officer.

692. These Chief Inspectors should concentrate on personal contact with the staff whom they are required to guide and train in safety measures. One aspect of their approach should be the importance which the staff must attach to their personal safety. This appeal to the personal safety of staff is likely to lead the individual to pay greater attention to the safety of others. We consider that in the selection of such Chief Inspectors, their aptitude, mission and dedication to the cause of safety should be the primary consideration and they should be handpicked men.

Safety Camps

693. We might mention here that a large number of witnesses told us that the short safety camps which were run by the various Railways

during the last few years with the object of inculcating safety consciousness in the staff were highly useful. The staff of various categories and of different departments used to gather in these camps. Discussions on safety matters including reference to recent accidents, why they were caused and how they could be avoided, and what were the practical difficulties of the staff in observing the rules used to form the main curriculum of such safety camps. Often senior officers visited the camps and participated in and invigorated the discussions. A retired Chairman of the Railway Board told us that these safety camps produced highly satisfactory results. He said that the object of organising these camps was that as large a number of staff as possible should go through them. The gathering together of staff of various departments and categories in one camp, their having community life and free discussions on safety aspects helped to enliven their safety consciousness for the future and created a marked impact on them.

694. We understand that safety camps were given up some time ago on the ground that a majority of staff had already passed through such camps. We regret, we are not inclined to agree with this reasoning. Safety consciousness is a continuous process and not something which needs to be instilled but once. The impact which a short stay at a safety camp may make is more in the nature of the appeal of a well devised slogan or of a message effectively delivered. By the very nature of things, a message of this nature may, with advantage, be pressed home at reasonable intervals. These safety camps should not be confused with the regular refresher courses to which we have referred in an earlier part of the Report. The object of the refresher courses is to refresh the knowledge of the staff with respect to knowledge of the rules and to bring them upto date so that they go back with a better idea of the rules and procedure of working which they have to follow. Safety camps, on the other hand, are not intended to deal with such routine rules and procedure. Their objective is to invigorate the safety consciousness of the staff. We would, therefore, urge that these short safety camps which have proved to be useful should be revived.

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695. *Safety Model Car*—We would also like to make a mention here of a highly enterprising effort made by the Divisional Superintendent and his officers at Lucknow in making a "safety model car" which we had opportunity to see. This safety model car is a mobile vehicle made out of an ordinary parcel van and aims at providing visual education on safety matters to staff on the line. In this car, various types of equipment used by staff concerned with train operation, their use and the rules pertaining to their duties, the precautions to be observed by the staff to prevent untoward happenings and accidents have been demonstrated in an attractive manner. A number of posters and slogans, photographs and charts have been displayed which catch the eye and make a direct appeal to the mind. The staff who visit the exhibition in the mobile car get an opportunity to discuss various matters with the demonstrators. The car thus functions as a safety seminar on wheels. In addition, the safety car is used as a model refresher course classroom for class IV staff. We were told that the project was a part of the safety drive and its aim was to take the message of safety to all stations of the division. The car is stabled at various junction stations according to a fixed programme so that the staff required to be given refresher course within a certain radius could attend it using convenient train services from and to their homes.

696. We were impressed by the initiative of the Divisional Superintendent and his officers and would recommend that other divisions of the Railways may also adopt similar imaginative methods.

697. *High visibility clothing*—We have already stressed the need for the emphasis which the safety organisation must lay on the personal safety of staff. A majority of the fatalities to railway staff are understood to occur to those railwaymen whose work exposes them to the danger of being struck down by trains or by other moving vehicles in yards. The fear of running down staff on the line is naturally a cause of great anxiety to drivers and shunting staff. In order to deal with this, the railways in the United Kingdom have devised high visibility clothing in the form of short highly visible jackets to be worn over the normal clothing so that the men working on or near the track are more easily seen by drivers of approaching trains both during day and night. We recommend that this device in an appropriate form be introduced on the Indian Railways for the safety of railwaymen.

698. *Inspections*—We would like to warn against the inspections of supervisors and officers in the safety organisation becoming routine inspections like those of other departmental supervisors or departmental officers. Inspections and spot checks by those in the safety organisation should be devoted solely to highlight unsafe methods of working and how they can be eschewed without undue detriment to speedy movement of traffic. Only then can the safety organisation justify its continued existence and serve the purpose which was the basis for its creation.



CHAPTER XVII

SUMMARY OF OBSERVATIONS AND RECOMMENDATIONS— ACKNOWLEDGEMENTS

Summary of Observations and Recommendations

699. For the reader's convenience, we have summarised in the following paragraphs the observations and recommendations made by us in the various chapters of this Report. We would, however, reiterate that for a proper appreciation of the purport of what is given in the summary, it is necessary to go back to the observations in the main paragraphs which set out the background, the evidence and facts and figures on which these observations are based.

Chapter I—Introductory

(1) Part I of our Report was devoted mainly to a review of the position of accidents on the Indian Railways since the appointment of the Kunzru Committee in the light of recommendations made by it and their implementation.

(Para 1)

(2) In this part of our Report, we have addressed ourselves to suggesting measures for further minimising accidents.

(Para 1)

(3) We consider that the record of safety of rail travel on the Indian Railways must be judged in the context of the task that the Railways are called upon to perform. Any sweeping generalisations which may be drawn from our observations on specific issues, itemised for the sake of clarity, in the first part of our Report or in this part, would be un-justified.

(Para 2)

(4) We do not wish our remarks to be taken to mean that nothing remains to be done to promote safety in rail travel. We feel that with increased axle loads, speeds and more intensive operation, the need for attention to the maintenance of track and rolling stock would be greater. The future may, therefore, necessitate a higher degree of safety precautions and consciousness than at present. The quest for safety in rail travel will, thus, have to be an unending one.

(Para 3)

(5) Notwithstanding the use of modern technological safety devices, we believe that the steps which the Railway administration may take not only to instil a higher degree of safety consciousness in its men but also to raise the general level of morale and keep the sense of duty pitched at a high level will pay rich dividends.

(Para 4)

(6) Apart from direct causes of accidents as brought out in the accident inquiry reports, we have addressed ourselves to the more deeprooted factors which even though largely latent do, in course of time, give rise to conditions which cumulatively have the effect of eroding whatever makes for organisational and individual efficiency; any drop in one or both of these assuredly makes an impact on the safety of rail travel.

(Para 6)

(7) We have gone into matters whose link with train operations though seemingly indirect is, nevertheless, in our view of a basic character, particularly the aspects concerning the human element as viewed from a wider perspective.

(Para 6)

(8) We are convinced that the extent to which the Railway administration is able to locate and remedy the factors—whether latent or apparent, remote or direct—which give rise to failure of the human element, to that extent a greater measure of safety in rail travel would follow.

(Para 6)

(9) We wish to strike a note of caution against exaggerated notions of economy which on occasions are apt to assail the railways as accidents result not only in direct costs but in indirect costs also, and to these costs get added the sufferings of the victims of accidents and the loss of the fair name of the railways which cannot be reckoned in terms of money.

(Para 7)

Chapter II—The human element

(10) We have, in Part I of our Report, shown that a large number of accidents is caused directly by failure of the human element. Even out of the remaining, a good number can be traced indirectly to the failure of staff to carry out properly their duties of maintenance of track, engines, rolling stock or signals. The mechanical devices and safeguards which may be employed by the Railway administration in its various fields of operation have still to rely for their operation or maintenance on the human mind and hand.

(Para 9)

(11) We are of the view that unless the standards of service discipline are of a high order, the eventual result of corporate effort would be indifferent and in a field of work like railway operation it would be attended with hazard.

(Para 10)

(12) We are convinced that while the Railway administrations and their core of dedicated workers have striven hard to increase the measure of safety and to improve their performance generally, the position would have been better and the level of safety and efficiency even higher but for the factors which have affected discipline adversely.

(Para 13)

(13) We think that the factors which generate indiscipline among the staff have also an effect on the morale of executives; in fact, whatever engenders one makes for erosion of the other.

(Para 15)

(14) While we recognise that the main function of trade unions is to protect the interests of the staff and strive for better working conditions for them, we feel that the unions have an equally vital role to play in inculcating duty-consciousness and a sense of discipline in the rank and file of the staff. We consider it necessary to emphasise the importance of the dual role which the trade unions are expected to perform and express the hope that this would receive due attention of the office bearers and members of the unions.

(Para 18)

(15) We consider that not only from the point of view of discipline among staff and the functioning of the administration but also of the workers themselves, it is advantageous that there should be only one recognised employees' union on each Railway with a recognised federation at the apex.

(Para 22)

(16) We recommend to the Ministry of Railways to explore ways and means whereby recognition is given to only one trade union on each of the Railways.

(Para 22)

(17) We feel convinced that the present system of allowing outsiders as union office-bearers leaves scope for non-railwaymen with political leanings and alignments with different political parties to gain control over the trade unions and direct the movement more with the aim of furthering their political ends than in the interest of the trade union movement.

(Para 25)

(18) We wonder if the time has not come when the railwaymen themselves can competently manage the affairs of the unions and effectively represent their case in negotiations. If necessary, they can take the help of salaried persons on their staff and of paid advisers and consultants. But actual leadership including all office bearers should come from the railwaymen themselves. This process would be facilitated and accelerated if the Railway administrations create a sense of security among their employees who function as office-bearers or enter into negotiations with them.

(Para 25)

(19) We understand that the problem of outsiders as union office-bearers is under consideration in a wider context by the National Commission on Labour and we, therefore, desist from making any concrete recommendations on this point.

(Para 25)

(20) We welcome the policy adopted both by the Railway administrations and the recognised unions on the Railways of not favouring recognition of sectional (category-wise) unions.

(Para 26)

- (21) (i) It is our view that staff in senior supervisory posts drawing gross emoluments of Rs. 500 per month or above should not be allowed to become members of recognised unions of railway workers.
- (ii) For all such supervisory categories we favour one separate association on each Railway with a federation at the apex which should receive due recognition of the Railway administration.
- (iii) It is desirable that some machinery in the nature of arbitration should be instituted by which collective problems concerning such supervisory staff which cannot otherwise be resolved should be dealt with.

(Paras 30 and 31)

(22) We find that of the grievances which figured most among the cases of individuals sponsored by the trade unions in respect of station staff and of driving staff—the top three places are taken by (i) payment of

arrears of pay, allowances, etc., (ii) sanctioning of increments, and (iii) confirmation or fixing of pay or seniority or promotion, in the order shown. We consider it doubly unfortunate since a properly managed Personnel Branch, even if it were not welfare oriented, ought certainly to be able to take care of these matters so that the staff do not have occasion to complain, much less feel the need of channelising these matters through the trade unions.

(Para 36)

(23) We are of the view that the role played by the Welfare Organisation in the matter of removal of genuine grievances of staff has evidently been ineffective. The Welfare Organisation has not succeeded in bringing contentment to the employees insofar as the redress of their individual grievances is concerned.

(Para 38)

(24) We welcome the working of some revitalised Welfare Bureaux in some of the divisions of the Railways.

(Para 39)

(25) We hope that the time will soon come when the staff all along the line feel that if they have some grievance or difficulty it is the Welfare Inspector to whom they should address it.

(Para 40)

(26) We recommend to the authorities the imparting of such orientation training to the Welfare Inspectors as will enable them to accomplish what their functional designation implies.

(Para 41)

(27) We appeal to the Ministers that they should do all they can to insulate the officers within their charge from outside influence. We hope that the Minister of Railways would be equally anxious to sustain the morale of his officers and would set precedents whereby outside intercessions are eliminated.

(Para 46)

(28) We consider it would be a healthy practice if the Minister of Railways were to lay on the table of both Houses of Parliament every quarter a statement giving the details about letters and representations received by him from Members of Parliament in the nature of intercessions on behalf of individual members of staff and indicating what, if any, action has been taken on them.

(Para 47)

(29) A more radical and fundamental method of eliminating political influence in such matters may be to convert the Railway Board into an autonomous statutory corporation as is the case in the United Kingdom. It is not, however, within the purview of this Committee to investigate into the pros and cons of this proposal and to pronounce on its desirability.

(Para 48)

(30) The functioning of the Vigilance Organisation and its role in its present form has engaged our attention. We cannot help observing that without any further loss of time, steps should be taken by the Government to undo the damage which has been done by the functioning of this

organisation which it might have once been thought, would root out corruption but which instead is throttling the healthy organism of the Railways. We would suggest action along the following lines:—

- (i) While nothing must be left undone to root out corruption in whichever quarter it may exist, it should be understood that this duty devolves squarely on the Railway administration itself and not on any organisation which has the semblance of an outside policing organisation. It equally devolves on the administration to protect honest and innocent officials from allegations by unscrupulous persons who may be nurturing grievances against their superiors or fellow-workers.
- (ii) No investigation should be taken in hand against any railway official, including a gazetted officer, without the concurrence of the Head of the branch or of the organisation corresponding to the status of the official against whom there is a complaint. While we would like to leave the procedure in this behalf to be settled by the Railway administration, we would as a broad guide line, suggest that for a class III employee other than a senior supervisor, the concurrence of the Divisional Superintendent (or an authority of an equivalent rank in the case of other than the divisional employees) should be obtained. For investigations against a senior supervisor, the prior concurrence of the Head of the department concerned should ordinarily be taken. In respect of an officer working on a Railway administration, the General Manager should be taken into confidence besides the concurrence of the Member concerned of the Railway Board. In seeking such concurrence, all the material available on the basis of which the case for investigation is sought to be made out should be placed before the competent authority and if the latter after considering the material finds that there is no case for investigation, the matter should not be pursued further and the discretion so exercised should not ordinarily be questioned.
- (iii) While we commend the directive that no notice must be taken of anonymous or pseudonymous complaints, we are of the view that the purpose behind this directive is set at naught by initiating investigations on 'source' information. We deprecate the practice of accepting such information. Such information should, except in extraordinary circumstances, not be given any credence. Only in very exceptional circumstances and that too when the authority competent to give concurrence for initiating investigation has personally satisfied himself as to the antecedents and motives of the informer may notice be taken of such information.
- (iv) In the Railway Board, the Directorate of Vigilance should be headed by a railwayman of considerable experience and proved integrity who should have the rank of a Director functioning directly under the Member Staff. We do not consider that there is any justification for the post of the Director General (Vigilance).
- (v) In the Vigilance organisation, both in the Railway Board's office and in the Railway administrations, the lower officers and inspectors should all be railwaymen having excellent record and reputation for integrity and a flair for investigation. In our

view, the police inspectors and officers who have little knowledge of railway working and who, in an organisation like the Railways would have problems of adjustment, do not have any utility in the Vigilance organisation.

- (vi) We welcome the assurance given to us by the representative of the Special Police Establishment that preventive checks not based on any specific complaints have been discontinued. We wish to record that such checks do not serve any purpose and if these have been discontinued, these should not be revived.

(Para 68)

(31) We would suggest a self imposed ordinance by the Central Vigilance Commission that only cases of officers in the Senior Administrative grade and above should be scrutinised by the Central Vigilance Commission. Cases of other officers should be left to be dealt with by the Ministry of Railways themselves.

(Para 69)

(32) In our view what is provided for in Article 311 of the Constitution is a time-honoured protection. We would, therefore, abstain from recommending that Article 311 of the Constitution be amended.

(Para 91)

(33) We do not see any reason why the penalties not provided for in Article 311 of the Constitution should be so treated in the Railway Servants Discipline and Appeal Rules. We would urge the Railway Board to take immediate action so that for the imposition of penalties other than those provided for in the Constitution, a summary and simplified procedure is adopted.

(Para 92)

(34) We reiterate that wherever there is scope for eliminating delays in the processing of cases of disciplinary action in departmental offices, such delays should be eliminated and the procedure for watching the progress of such cases in departmental offices streamlined.

(Para 93)

(35) It occurs to us that the disciplinary inquiry can, with advantage, be conducted by special inquiry officers trained and deputed exclusively for this purpose. These officers should form a part of the Personnel Branch and should be chosen with great care so that they have a good knowledge of the Discipline and Appeal Rules and where possible also some knowledge of law as well as legal procedures.

(Para 95)

(36) We are of the view that senior supervisors should be recognised as junior members of management. With a view to restoring the position and authority of senior supervisors and strengthening the measure and quality of their supervision over the working of staff, we offer the following suggestions:—

- (i) It is desirable that senior supervisors are always consulted in regard to the promotions and transfers of staff in their charge.
- (ii) The number of grades of senior supervisors should be reduced. As far as possible, most of the grades of senior supervisors should be selection grades. They should be so devised that the top of one grade is well below the starting point of the next

grade so that when a person is promoted to the next grade, there is a substantial rise in emoluments. The present grades were last considered by the Second Pay Commission a decade ago. Though a wholesale review of the grades of senior supervisors is a matter to be dealt with by a future pay commission, as an interim measure, we would like to suggest that the top-most grade of senior supervisors should be appropriately raised keeping in view the present day conditions as also the scales of senior supervisors in comparable posts elsewhere.

- (iii) Wherever there is a large concentration of staff working under a senior supervisor, the post should be upgraded to gazetted status, Class II. We would leave it to the Railway Board to work out the implications of this scheme in consultation with the Railway administrations. As a broad guideline, we suggest that wherever there is a concentration of say 300 to 500 men, the status of supervisors should be raised to Class II. We would, however, stress that special care should be taken in selecting the right type of men whenever it is decided to upgrade the posts of senior supervisors to Class II category. It would in our view be advisable to retain the present designations. If at all any modification is called for, we recommend that for the sake of uniformity the upgrading posts may be redesignated as Yard Superintendent, Shop Superintendent, Loco Superintendent, Station Superintendent, etc.
- (iv) The most constructive step in fortifying the self-confidence of senior supervisors and discipline among staff would, in our view, be to create conditions whereby it becomes known right down the line that the action taken by the supervisors on the spot will ordinarily receive the support of the administration.

(Para 105)

- (37) (i) It must be appreciated that reservation of posts in favour of a community or a group of people must not be at the cost of overall efficiency of the administration.
- (ii) At the stage of initial recruitment there is no objection to reservation of quotas for scheduled castes and scheduled tribes. At the promotion stage, however, such reservation can give rise to a feeling of inequity among the staff who have already put in several years of service.
- (iii) We consider that the Government should now review the question of reservation of quotas for, and the weightage given to, scheduled castes and scheduled tribes at the promotion stage in the context of the present-day conditions and in the light of the evidence referred to by us in this matter.

(Paras 109 & 110)

(38) We recognise that if a vast organisation like the Railways is to function efficiently, it must have in its superior cadres men of the best calibre available. Obviously, the objective is unlikely to be achieved unless service conditions are such as to attract talented young persons.

(Para 118)

(39) (i) We realise that it is not our function to spell out the details of the proposals for improving the pay scales and prospects of officers, but we are anxious that the general feeling of discontent should be cleared up and the cadre structure of railway officers should be so recast that from the

point of view of prospects, the best talent is attracted to the Railway services.

(ii) We understand that the Administrative Reforms Commission went into this matter in considerable detail and have made certain recommendations. We have no doubt that the Government will consider these recommendations closely, appreciating the need for urgent action. We would, on our part, urge them to devote their attention to this problem without loss of time.

(Para 119)

(40) We find that there is a general awareness in the Railways of the problem of officer-staff and supervisor-staff ratios and the inadequacy of the present ratios. We would like to leave it to the Railway Board and the Railway administrations to work out after proper scientific study the appropriate ratios between officers and the staff. We think that to improve the ratio, the matter would have to be tackled from both ends, that is, to strengthen the number of officers and supervisors wherever required on the one hand and to make suitable adjustment in the number of men in the various wings on the other.

(Para 123)

(41) The present set-up on the Railways has no doubt stood the test of time but in the present situation with the increasing tempo of traffic, increase in manpower and complexity of management problems, a time has come when serious thought should be given to streamline the command structure on the Railways to deal with the challenges of the present and the future. One way in which this may be accomplished is for the organisational structure to be subjected to an expert study.

(Para 124)

(42) We refer to the various reasons adduced for increase in unproductive paperwork. We are aware that this state of affairs is not peculiar to the Railways and also that the reasons are hardly likely to lend themselves to an easy solution. But we consider that consultancy in the matter of office procedures as also in other fields may open up the management to fresh and useful ideas.

(Paras 125 and 127)

(43) We suggest that the Railway Board and the Railway administrations should investigate whether any further devolution of authority and delegation of powers would not be conducive to a reduction in the volume of correspondence and paperwork. We would, however, strike a note of caution that any delegation of powers can have utility only if the authority to whom the power is delegated is allowed to exercise the power and obviously it will be rendered ineffective if distrust in the man on the spot continues to prevail.

(Para 128)

(44) (i) We consider that in a vast organisation like the Railways which employs more than a million workers, labour science research would not be a mere refinement or a needless sophistry but an organ of considerable practical utility.

(ii) We find that even with the highly limited objectives which the Psycho-technical Cell in the Railway Board has set for itself, the progress which it has made so far has been insignificant.

(iii) We consider that the scope of such studies should be enlarged so that it is not confined merely to building up of some aptitude tests but encompasses the broader problems of the socio-psychological make-up of the railway worker and of human engineering which have particular reference to rational safe working on the railways.

(iv) We commend for the consideration of the Railway Board that they ascertain from the Railway Labour Science Research Institute on the Japanese National Railways and from similar institutes which the railway systems in other advanced countries may have established, the fields of investigation which they undertake and the techniques adopted and thereafter draw up an integrated programme of socio-psychological study and research.

(v) It occurs to us that the Universities and other institutes and foundations in the country engaged in pursuits of this nature may be in a position to aid the railways in such studies.

(Para 131)

Chapter III—Training of staff

(45) We found the arrangements for general-purpose training of staff generally adequate except for a few isolated instances of shortcomings in the facilities for training like inadequacy of hostel accommodation at the Zonal Training Schools at Alipurduar and Tiruchchirapalli, and non-supply of accident enquiry reports of the Additional Commissioners of Railway Safety to Zonal Training Schools. It was also indicated to us that there was ample scope for intensifying the training of drivers, train examiners, trade apprentices, etc. at Jamalpur.

(Paras 133-134)

(46) We were struck by the absence of a Zonal Training School on the South Central Railway. We consider it essential that the setting up of a Zonal Training School and the creation of training facilities on the South Central Railway is not delayed further.

(Para 135)

(47) We consider that with the introduction of modern highly sophisticated equipment in various fields of railway operation, it has become imperative that the staff entrusted with the responsibility of handling, operation and maintenance of the equipment are imparted adequate and intensive training.

(Para 136)

(48) We are of the view that an approach to training which aims at leaving the trainee to his own resources is neither systematic nor scientific and we hope that the Railways would shed their complacency regarding the present practice of imparting indifferent training to electrical signal maintainers.

(Para 139)

(49) We strongly urge the setting up of a well-equipped training centre on each Railway for the training of electrical signal maintainers needed for the maintenance of modern signalling equipment. These centres should be adequately equipped with the working models of modern signalling installations and lessons should be given on basic techniques, installation and maintenance. Curricula should be framed for both initial and refresher training.

(Para 140)

(50) We consider that the question of recruitment, training and grades of signalling staff calls for an urgent decision and would be in the interest of safety in operation which modern signalling equipment aims at providing.

(Para 141)

(51) We suggest that the panel operators to be employed for operating route relay installations, centralised traffic control etc. should be trained in the centres set up for training of signal engineering staff.

(Para 142)

(52) We feel that before panel operators are employed on the operation of modern signalling equipment, competency certificates should be issued to them by authorised officers of operating and signalling departments jointly after proper test.

(Para 142)

(53) It is suggested that mechanical and electrical cadres of signalling staff should be combined and integrated into a single cadre. This step would, in our view, result in closer inspection and better maintenance of signalling equipment.

(Para 143)

(54) We consider that the implementation of the following suggestions made to us would be a step in the right direction:—

- (i) A centralised training school should be set up to train supervisory staff of all Railways in inspection and maintenance of electric rolling stock and traction equipment on the lines of the Signal and Telecommunication School at Secunderabad.
- (ii) Each Railway having electric traction should have a school for training of artisan staff and for giving them refresher training. This school should also cater for the training of staff employed for the maintenance of general electric and train lighting services.

(Para 145)

(55) We suggest that the Railways should create adequate facilities in their System Technical Schools or alternatively in schools attached to the diesel locomotive sheds for imparting proper training to the staff employed on the maintenance of diesel locomotives.

(Para 146)

(56)(i) Though several Railways have introduced the pattern of training of diesel and electric drivers through training in simulation cabs, we feel that a greater degree of uniformity in this important 'conversion training' is necessary. Detailed curricula of training under Indian conditions should, in our view, be drawn up after a careful study.

(ii) We commend to the Railways the suggestion that the techniques adopted for training the drivers for diesel and electric locomotives should be on lines similar to those employed for training of aircraft pilots. In our view, simulation training should be organised with great care if a crash programme of converting steam locomotive drivers into diesel or electric locomotive drivers is to be gone through.

(iii) We consider that the driving staff for diesel and electric locomotives should have adequate educational and technical background. Where they have to be selected from amongst steam locomotive drivers, they must

be screened carefully and considerations of seniority etc., should not be allowed to come in the way of proper selection of men.

(iv) It is necessary that the staff selected for working diesel and electric locomotives should be put through a systematic course of training under the guidance of fully trained and experienced personnel. The 'conversion training' given to steam locomotive drivers would, unless it is on a systematic and properly directed basis, be hardly adequate to accomplish an efficient change-over.

(Paras 147 to 150)

(57) We suggest that the Railways should keep a special watch on the nature of lapses on the part of the diesel and electric locomotive drivers which result in accidents as these may be useful pointers to the shortcomings in their training.

(Para 151)

(58) We are of the view that the aptitude tests which have been evolved or are in the process of being evolved by the Psycho-Technical Cell should, in the first instance, be applied to the categories of electric and diesel locomotive drivers before selection or recruitment.

(Para 151)

(59) We stress that the success of mechanised inspection and maintenance of track would depend on the availability of suitable personnel for maintaining and handling the equipment no less than on the equipment itself.

(Para 152)

(60) It would, in our view, be advantageous if an integrated programme which provides intensive training to the staff in mechanised maintenance and inspection of track both in the works of the firm manufacturing the machines as also in the field is evolved.

(Para 153)

(61) (i) We agree that scientific approach should be inculcated in staff dealing with long-welded rails through initial training and frequent refresher course. This, in our view, should also hold true in case of staff deputed for maintenance of track by measured shovel packing.

(ii) We suggest that necessary facilities should be built up on each Railway and, as a first step, instructors for these jobs should be trained by the RDSO or at a suitable centralised training centre.

(Para 154)

(62) We feel that the setting up of a school for the training of staff in the use of ultrasonic flaw detectors should receive high priority.

(Para 155)

(63) (i) We feel that necessary facilities for imparting training in scientific methods of materials management will have to be created on the Railways or in a centralised institution.

(ii) We suggest that the possibility of making use of the Indian Railways School of Electrical and Mechanical Engineering, Jamalpur or other similar institutions or of developing alternative facilities for training of stores personnel be examined.

(Para 157)

(64) We consider it essential that training in service should be intensive, regular and should be more job-oriented than theoretical as is the case at present.

(Para 158)

(65) We emphasise the need for the proper training of inspectors and other supervisors since ultimately the interpretation of what the administration requires its workers to do rests in the hands of these men who are in direct contact with the workers. On the quality of these men depends not only the image of the administration in the eyes of the workers but also the quality of output which would ultimately emerge.

(Para 160)

(66) It is of vital importance that specialised courses are arranged for inspectors and supervisors both to develop their outlook and to make them professionally more competent. Indeed, this matter is so important in our view that it should receive the attention of, and may be watched by, the General Managers themselves. We have no doubt that those who undergo such specialised courses would emerge as better inspectors and better supervisors.

(Para 160)

(67) We understand that arrangements were made for conducting a centralised course in supervision and management in the Zonal Training School at Chandausi. Judging from the fact that in the last four or five years only four courses were held, it is doubtful if the matter is receiving the attention which it deserves. We are also doubtful if the facilities and the calibre of instructors at Chandausi are such as to make it possible to orient the course with an all-India outlook.

(Para 161)

(68) We suggest that refresher training of senior supervisors belonging to civil engineering, transportation and mechanical engineering departments should, like those of the signal engineering department, be arranged at the respective all-India training centres at Poona, Baroda and Jamalpur. Specialised courses of three to four weeks duration organised at regular intervals should make it possible for all inspectors and supervisors to be trained and oriented reasonably adequately within a short span of time. If the existing facilities at these institutions are inadequate, it would be well to augment them suitably.

(Para 162)

(69) The following suggestions were put forward in evidence which merit consideration:—

(i) An experienced officer should be specially selected and put in-charge of the probationary officers when they come on the open line to pick up the actual work they have to do so that they are not left to their own resources to pick up what they can. There should be a wholetime training officer deputed for the purpose. We understand that a scheme has been started for probationary transportation officers at Asansol where young trainee officers receive field training under the guidance of an experienced wholetime officer. We welcome this step and urge that similar steps should be taken for trainee officers of other depart-ments.

- (ii) Senior seasoned officers should be deputed to go as roving instructors. They should spend some time with the officers, even upto the Divisional Superintendent's level, and guide them in their problems as friends rather than as critics.
- (iii) The officers and supervisors of technical departments should be so trained as to receive specialised training in particular trades while acquiring broad knowledge of railway working in other fields.

(Para 163)

(70) We consider that a young officer is an asset on whom no investment is too heavy to make him professionally competent and a good manager of men.

(Para 164)

Chapter IV—Other staff matters

(71) (i) We are of the view that the conditions which brought about the setting up of the Railway Service Commissions do not exist any longer.

(ii) We suggest that recruitment of staff in all mass categories and semi-mass categories should be left to the Railway administration and the recruitment should be decentralised to be made at the divisional level.

(iii) We consider that it will be adequate if a Committee of two officers is appointed by the Divisional Superintendent to make the recruitment of staff in various categories at suitable intervals.

(iv) We further suggest that categories of staff other than mass categories and those for which either the minimum qualification is a university degree or a technical degree or diploma or which are otherwise specialised as for example, nurses, school teachers, printing press staff, etc. may continue to be recruited through the Railway Service Commissions.

(Para 170)

(72) (i) We consider that for staff engaged in the operation and maintenance of diesel and electric locomotives, modern signalling equipment, tie-tamping machines, complicated hydro-electric and electrical equipment in the workshops etc. a good basic education and certain minimum technical qualifications are essential so that the staff who are entrusted with the responsibility of operation and maintenance of modern equipment are not raw and uninitiated hands but have an intelligent and effective grasp of the equipment they handle.

(ii) We suggest to the Railway Board and Railway administrations to evolve the minimum basic qualifications for each of these categories. We have no doubt that in the present conditions, there would be no dearth of men having the requisite qualifications.

(Paras 172 to 174)

(73) (i) In our view, the essential staff who should receive preference in the allotment of houses should be such personnel as are liable to be called for duty at any time at short notice or at odd hours and but for whom train running would be immediately hampered.

(ii) Considering that the available accommodation is inadequate to house even the more essential categories of staff and that it would obviously take a long time to build new quarters in significant number, we would, first and foremost, suggest that the Railway Board should bring

about uniformity in the classification of staff as essential and non-essential.

(iii) Since even among the essential categories, priorities may be different and since it may not be politic to deprive non-essential categories of housing accommodation altogether, we suggest that a priority schedule may be prescribed in more or less the same manner as a priority schedule for allotment of wagons.

(iv) The first priority in housing should go to the running staff and the second priority to train passing staff like station masters, switchmen, cabinmen, shunting jamadars etc. Signal maintainers who are likely to be called at night may also be included in the latter group. The policy in regard to building of new quarters and their allotment should be based on the priority schedule.

(v) Of the existing accommodation, as a rule, all quarters allocated for essential staff should, on vacation, be allotted to essential staff keeping in view the priority schedule. Of the other quarters falling vacant, 50 per cent should be allotted to the essential staff so that a progressively higher percentage of essential staff is housed in accordance with the priority schedule laid down.

(Paras 179 and 183)

(74) It has been suggested that to the extent money is spent on housing of staff, the Railway administration should get relief from payment of interest on capital. In this manner, it may be possible to accelerate the rate of building of quarters substantially and house the staff within a few years. In our view, there is considerable strength in this plea and we would urge the Government to give this matter their closest consideration.

(Para 184)

(75) (i) We would suggest that the work of signal maintainers should be properly job-analysed and if the nature and quantum of work is such that they should be put on rosters of 8 hours or 12 hours, steps may be taken accordingly.

(ii) Wherever the position is such that a signal maintainer who may have been working during the day is often required to attend to failures during night also, a more permanent solution of the problem would have to be found since we have no doubt that in days to come, demands on the time of signal maintainers would increase.

(Para 187)

(76) We urge that vigorous steps should be taken to ensure that 12 hours running duty is ordinarily the limit and that cases of running duty exceeding 12 hours are brought down further and are an exception rather than a rule.

(Para 191)

(77) It was observed by the National Federation of Indian Railway-men that under the hours of employment regulations, a continuous worker was required to perform 8 hours duty a day, but for payment of overtime the basis of 54 hours a week and 231 hours in a month was adopted. We think that the trade unions would already have brought up this matter before the Railway administrations and the Railway Board. We, therefore, leave it to the Railway Board to examine the contention of the Federation.

(Para 193)

(77a) (i) We are unable to see the merit of the arrangement under which the assistant station master at stations manned by one station master and one assistant station master is continually on night duty for months and sometimes years. We urge the Railway administrations to go into this matter closely and find a satisfactory solution.

(ii) In the absence of any other alternative, we are of the view that it may be possible to re-roster the duty shifts of the assistant station master and the station master so that the shifts change at midnight and 12.00 hours noon, the assistant station masters coming on duty at midnight.

(iii) On sections where traffic is very light and where there are such stations, the Railway administrations may also examine the possibility of scheduling the trains in a manner that the station is closed during the period say from 22.00 to 04.00 hours so that the assistant station master is not on duty right through the night as a permanent measure.

(Para 200)

(78) (i) We urge that the yardsticks prescribed for the provision of amenities in the running rooms should be rigidly applied in order to ensure that adequate facilities are available for the comfort of the running staff.

(ii) It is important from the point of view of safety of train operation that running staff in the categories of drivers, firemen and guards should not in any circumstance be deprived of adequate rest at the end of their journey. The practice of travelling ticket examiners occupying beds in the running rooms, either singly or in squads, should be stopped. We would urge that wherever a complaint of this nature exists there should be separate arrangements for accommodation of travelling ticket examiners, conductors, etc.

(Paras 202 and 203)

(79) (i) We emphasise that when a decision is taken to provide uniforms to certain categories of staff, non-supply or irregular supply of uniforms thereafter is a source of needless discontent and frustration in the staff.

(ii) There were several complaints to the effect that the uniforms supplied were ill-fitting. An ill-fitting uniform is a stigma on the management. We have a feeling that not much thought is given to this matter. We do not see why the railway or its suppliers, should not find it possible to supply to each employee a uniform which fits him more or less to size.

(iii) We are also of the view that categories of staff whose work is entirely outdoor may be provided with raincoats. Overcoats may also be provided to staff in the categories of shunting jamadars and gangmen where the need for providing these seems justified.

(Paras 206 and 207)

CHAPTER V—*Rules, Rule Books and Manuals*

(80) (i) We would welcome a revised set of rules which provide for the technological changes that have taken place in recent years and suit the requirements of the growing system and from which all the out-dated rules have been weeded out.

(ii) We recognise that with the weeding out of superfluous and redundant rules and cutting out of dead-wood, renumbering of rules would be inescapable to maintain continuity. If, however, some way can be found

to retain the old numbers for at least the more important rules like those pertaining to giving permission to approach, taking off of signals, etc., it would certainly impose a much lighter burden on the staff than if they are faced with a set of rules in which there is no shred of similarity.

(iii) We realise that the work of revision of rules has already gone sufficiently ahead. We, therefore, leave it to the Railway Board to see to what extent the general arrangement of this basic vocabulary of staff concerned with train running can be retained.

(Paras 210 to 213)

(81) (i) In our view, the justification for publication of the statutory rules and codes in bilingual form exists only when they are required for reference but when a rule book is required to form the personal equipment of the staff, insistence on its being bilingual is ill-conceived.

(ii) We suggest that Rule Books intended to be for the personal use of staff should be printed in English, Hindi or in the regional language as separate editions and the staff may be supplied these books according to their requirements.

(Para 215)

(82) (i) We recommend that arrangements may be made for the compilation of unified manuals on mechanical engineering and electrical engineering applicable to all the Railways.

(ii) We consider it necessary that efforts are made to see that there is as wide a ground of agreement among the Railways as possible in regard to the practices and procedures proposed to be unified and incorporated into the manuals.

(Para 216)

(83) (i) We have seen the handbooks brought out by the Railway Board in recent years for different categories of staff, viz., station masters and assistant station masters, guards, switchmen and cabinmen, levermen and pointsmen, gatemen, yard staff and permanent way staff. These handbooks appear to us useful and interesting.

(ii) We recommend that similar handbooks should be brought out for the use of drivers, train examiners, route relay interlocking maintainers and panel operators, centralised traffic control maintainers and panel operators, staff concerned with maintenance and operation of diesel and electric locomotives, train lighting staff, etc.

(Paras 217 and 218)

CHAPTER VI—Permanent Way

(84) We consider that for providing a modernised track structure 60 Kg. rails should be laid not only on sections carrying more than 20 gross million tonnes traffic but also on other trunk routes where the density of traffic may not have reached that level but may be rapidly increasing.

(Para 221)

(85) The length of track so far laid with long welded rails on the Indian Railways is not a significant achievement. We hope that adequate and timely action will be taken so that the Indian Railways go in for long welded rails extensively.

(Paras 226 and 228)

(86) We reiterate the need for a firm and long-term integrated plan for the procurement of concrete sleepers as well as matching elastic fastenings so that the plan for modernisation of track does not suffer on this account.

(Para 229)

(87) We consider it important to stress that unless adequate steps are taken to ensure that the manufacturers of elastic fastenings fulfil their commitment, it may not be possible to put the prestressed concrete sleepers to use. A situation in which elastic fastenings lag behind the supply of concrete sleepers or vice-versa would be indicative of inadequate planning and may result in infructuous expenditure.

(Para 231)

(88) During the course of inspections carried out on short lengths of track on some of the Railways, we found that :—

(i) Often sleepers were out of square, keys of steel-trough sleepers were driven rather indiscriminately, sleeper spacings were not according to drawings, some rail joints had nearly run on to joint sleepers due to creep, and correct templates had not been used, the spiking being anything but trapezoidal ;

(ii) the work of providing guard rails on girder bridges on some small spans of prestressed cement concrete girders had yet to be completed. Instead, guard rails had been provided on earth cushioned arch and flat-top bridges and culverts which, in our view, serve no purpose. Nor were the guard rails fixed according to the instructions issued by the Railway Board. Walk-ways made out of unserviceable sheets had not been provided on all the girder bridges; and

(iii) Gate lamps were without masking arrangements. The road approaches were steeper than the limiting grade of 1 in 20 at 'C' Class level crossings. The discs fixed to gate shutters were not painted bright red and the catches and stops for gate shutters were ineffective.

(Paras 238 to 241)

(89) Even though these observations are limited in character, it is evident that a lot needs to be done to improve the general standard of maintenance of track.

(Para 242)

(90) It is necessary that the staff entrusted with the maintenance of track are enjoined to adhere to the instructions laid down if the state of the track is to improve. We also consider that conditions have to be created to cope with the present and future trends of heavier train loads and heavier rolling stock running at higher speeds.

(Para 242)

(91) In our view, the programme of track maintenance round the year should aim at the following:—

- (i) The sequence of track maintenance operations should be arranged according to the climatic periods so as to obtain the best results;
- (ii) A reasonable turn-over per unit labour for each specific track maintenance operation should be ensured. Scientific work studies of the various operations would, in our opinion, yield useful results.

(Para 242)

(92) We suggest that the mechanics of 'renaissance' in track maintenance as enunciated by the South Eastern Railway be tried over some sections in order to get a correct appraisal of its value and the results placed before the Track Standards Committee.

(Para 244)

(93) (i) We consider that the screening of ballast between two sleepers should be done at every quarter of a kilometre taking care that the cores under the sleepers are not disturbed. The results should then be plotted on a diagram showing the clean stone ballast content in the track.

(ii) The ballast diagrams should be revised once in five years or so.

(iii) The engineers should test check the requirements of ballast by permanent way inspectors on the basis of ballast diagrams.

(Para 245)

(94) We suggest that wherever the content of clean ballast falls below 35 per cent in the track, complete reballasting should be carried out.

(Para 246)

(95) We suggest that the percentage of unserviceable sleepers in the track should be reduced to the barest minimum. Eventually, any sleeper that is considered spike-killed or otherwise unserviceable should be promptly renewed.

(Para 247)

(96) There appears to be need for having a uniform conception of when a bridge is to be treated as distressed on condition basis or on hydrological considerations.

(Para 248)

(97) We urge that bridges considered distressed should be speedily rehabilitated on a programmed basis, a higher priority being given to structures which require to be rebuilt on age-cum-condition basis.

(Para 249)

(98) We reiterate the factors which should be the basis for determining gangstrengths:—

- (i) Optimum standard of maintenance for each classification of track based on the maximum speed and traffic density;
- (ii) schedule of work 'round-the-year' for the required optimum standard of track maintenance;
- (iii) assessment of the number of man-days, based on average output of work for each operation per man-day, to conform to the specified 'round-the-year' schedule;
- (iv) additional strength required to cover such factors as require extra attention over and above the normal; and
- (v) the optimum length over which a given gangstrength can carry out effectively and without default every track maintenance operation.

(Para 250)

(99) We suggest that the Track Standards Committee should go into the matter of gangstrengths and evolve a system of basic strength units according to track classification. These basic strength units may be augmented by co-efficients based on local characteristics of various sections

of the Railways. The Railway Board should be guided by the advice of the Track Standards Committee. We suggest that while evolving the basic strength of a gang, the working and living conditions of gangmen should not be ignored.

(Paras 251 and 252)

(100) We suggest that the Railway Board may consider the question of procurement of an adequate number of curve correctors so that an instrument is available for each division on the Railways.

(Para 256)

(101) After accurate reconditioning of each curve with special emphasis on the transitional approaches, curve alignment registers should be maintained showing therein the versine and superelevation at each 'station'.

(Para 257)

(102) The 'stations' should be marked in white paint on the inner side of the outer rail and the superelevation on the inner web of the inner rail.

(Para 257)

(103) General Rule 90 prescribes a speed restriction of 16 km.p.h. on turn-outs. The Rule, as it stands, makes no distinction between the various gauges nor does it make any reference to the angle of crossing, the track structure or the type of locomotive. These are matters which require considerable study and research to ascertain the stage at which dangerous conditions are liable to occur and to lay down limits of safe speed. We consider that General Rule 90 should be more specific and should be revised in the light of such study and research.

(Paras 258 and 259)

(104) We consider that small and inexpensive devices like a magnifying glass as well as a mirror can be provided for the use of gangs for detecting flaws in rails wherever rail failures are frequent.

(Para 264)

(105) We consider that ultrasonic rail flaw detectors are essential for detecting rail flaws and would urge that an adequate number of these are made available for use on Railways. Annual testing by ultrasonic rail flaw detectors would, in our view, provide an effective practical check though more frequent testing should be carried out where track conditions so warrant.

(Para 268)

(106) We suggest that from now on research and development of a self-propelled ultrasonic rail inspection car should be taken in hand so that before long each zonal Railway has one for use on its system.

(Para 269)

(107) We suggest that each case of rail failure, as it occurs, should receive close attention of the administration by way of chemical analysis, investigation of the previous history of failures of rails of the same type and age and other cognate factors.

(Para 271)

(108) We note the decision of the Railway Board to extend the method of measured shovel packing in the light of experience gained but would like to point out that if a section of the track is subjected to mechanised maintenance in the first instance, its subsequent maintenance by measured shovel packing is more satisfactory and lasts longer. We would like the Railway Board to bear this in mind while planning for extending the use of measured shovel packing.

(Para 275)

(109) In regard to the general adoption of directed track maintenance, we consider that:—

- (i) It is an essential prerequisite of directed track maintenance that suitable means of transport should be available to convey gangmen and their equipment to and from the site of work;
- (ii) the benefit from concentration of effort over a selected length of a few miles of track which directed track maintenance involves has to be carefully weighed against the disadvantage due to the withdrawing of gangmen and their supervisors on many other sections of the track to form a part of the scheme and the resultant longer intervals between inspections and slackening of supervision; and
- (iii) in respect of optimum ganglength, a four-mile length of single line has, for some years, been a limit; conditions today, if anything, indicate the necessity for shorter rather than longer lengths for inspection and supervision to be effective.

(Paras 278 and 279)

(110) (i) At present, the Indian Railways have only a limited number of 'on track' mechanical tamping machines and the indigenous capacity for their manufacture is unlikely to be adequate in the years to come to meet the requirements of Railways if they were to adopt mechanised maintenance of track extensively.

(ii) We feel that the factor of foreign exchange component in the cost of mechanical tie tamping machines should not deter the Indian Railways from working out a programme for switching over to modern methods of track maintenance on its trunk routes and main lines.

(iii) The programme should take into consideration the economics as well as the safety aspect of mechanised maintenance and of other modern means of maintenance of track so that an integrated plan is worked out and the actual effect of modernisation is felt in the next few years.

(iv) Clean stone ballast for an adequate depth below the sleeper is a prerequisite for the working of an automotive tie tamper. This condition obtains on some sections of the trunk routes but, by and large on the main and branch lines the mixture of 'muck' with stone ballast is considerable. We feel that it will take some time before all sections are made fit for mechanised maintenance.

(v) The use of automotive tie-tamper will also involve revised spacing of joint sleepers.

(vi) A concomitant of mechanised maintenance is the availability of traffic blocks on busy sections so that automotive tie tamping machines can be put to optimum use. The train time tables on such sections should be framed in a manner that a block of time of about four hours can without

difficulty be allotted for mechanised maintenance of track and for maintenance of other equipment.

(Paras 280 to 282)

(111) (i) In our view, no less important than the maintenance of track is the inspection of track by modern methods.

(ii) We had, in Part I of our Report, expressed concern over the delay in manufacture of track recording cars. We feel that if Government are unable to manufacture these test cars within a reasonable time, they should not hesitate to obtain them from elsewhere.

(iii) We consider it necessary that improvements should be effected to enable the track recording car to record all track irregularities at higher speeds accurately.

(iv) We are of the view that Hallade track recorder is a useful instrument for testing the riding qualities of the track at high speeds.

(v) We urge that steps should be taken to acquire track recorders in adequate number so that each division has one to itself.

(vi) The divisional officers and staff should be encouraged to use these instruments intensively and should be trained in the evaluation of the results recorded by the instruments.

(Paras 283 to 285)

(112) We leave it to the Railway administrations to see if the special reports submitted by the permanent way inspectors to the divisional officers serve the purpose of giving the latter a fair idea of the section and of their difficulties; if not, it might be useful to revive the six-monthly report, if necessary, in an abridged form.

(Para 286)

(113) (i) We are of the view that in all cases permanent way inspectors and signal inspectors should be relieved of their stores charge and should be held responsible only for the imprest issued to and required by them for their day-to-day work.

(ii) Where a permanent way inspector and a signal inspector are both headquartered at the same station, the person entrusted with the maintenance of permanent way stores can be concurrently responsible for signalling stores. At other places, separate arrangements may be made.

(Para 291)

CHAPTER VII—Level Crossings

(114) We reiterate what we had said in Part I of our Report that a census every five years is necessary to determine whether an unmanned level crossing is to be manned or a manned level crossing is to be upgraded.

(Paras 292 and 293)

(115) (i) We consider that norms should be laid down for the purpose of deciding whether a case exists for manning an unmanned level crossing or upgrading a manned level crossing.

(ii) A rigid yardstick or standard is not necessary. The yardsticks may provide for deviations in the light of local conditions on the merits of each case after taking into consideration the need for safety.

(iii) The existence of norms would firstly provide broad guide-lines for the Railways to work upon and secondly would ensure uniformity of procedures at level crossings on the same or contiguous sections having more or less the same quantum of road and rail traffic.

(Paras 294 and 295)

(116) (i) We are unable to see the merit of a system in which certain gates are manned by only one gateman.

(ii) We suggest that at 'C' class manned level crossings with only one gateman, an appraisal of the traffic using the gate should be made speedily and depending on the result, the Railway administration should decide whether a case exists for having two men at such gates or whether the gate should be unmanned. In no case, in our view, should a gate remain with only one man on duty all the 24 hours.

(Paras 297 and 298)

(117) We had suggested in Part I of our Report that a part of the Railway Safety Works Fund—to the extent of 10 per cent—should be made available to the Railways in case a decision is taken to man an unmanned level crossing or to upgrade an existing manned level crossing. We hope that a satisfactory solution has since been found which would enable the Railway administration to draw directly from this Fund upto the extent of 10 per cent for the above purpose.

(Para 299)

(118) We think that to save road traffic from long and irritating detention to the extent possible and at the same time to ensure safety, it is necessary to have some kind of reliable communication between the gate-man at a mid-section level crossing and the station on one side or the other.

(Para 300)

(119) With a view to minimising detention to road traffic at level crossings within station limits, the station staff must be educated to see that signals are not taken off much in advance of the approaching or the departing train.

(Para 301)

(120) We suggest that whenever on sections equipped with multiple aspect signalling lower quadrant two aspect signals protect midsection level crossings, they should be replaced by multiple aspect signals. It is essential that there should be uniformity in the type of signalling provided on a section.

(Para 302)

(121) We are of the view that all important level crossings should be provided with sympathetic barriers of the lifting type equipped with eccentric wheels which actuate bells and flashing lights indicating to the road users when the barriers are being lowered or raised.

(Para 303)

(122) (i) It would, in our opinion, be worthwhile experimenting with automatic half-barriers to see if they can successfully take the place of manned level crossings with due measure of safety.

(ii) We think that at least near about the cities where automatic light signals are in use at road crossings and the road users have got used to them, the Railways may with advantage and without undue risk experiment with automatic half-barriers.

(iii) We stress that while installing automatic half-barriers, conditions should be created by which breaking the queues and zigzagging by road users is rendered difficult if not impossible. It may be necessary to fix small raised and prouded blocks with a height of six to twelve inches in the centre on both approaches of the level crossing for an adequate distance.

(Paras 305 to 308)

(123) We suggest that provision may be made for the prosecution of those road drivers who disregard the automatic half-barriers in the same way as a road driver is liable to prosecution if he ignores traffic lights.

(Para 310)

(124) (i) We stress that if the experiment with automatic half-barrier is to be made a success, special care will have to be taken to guard against vandalism and theft of ground equipment.

(ii) It is important that wherever such automatic half-barriers are installed and are actuated by approaching trains, the installation works in perfect order and safety is not endangered.

(iii) We feel that should the installation fail far too often, the respect which the road user may have for the installation is likely to decline resulting in the experiment not proving a success.

(Para 311)

(125) (i) We are of the opinion that from now on the construction of level crossings should be avoided wherever possible and reduced to the barest minimum. A level crossing should be provided only when for some unavoidable reason, it is not possible to have an over-bridge or an under-bridge.

(ii) We hope that the amount collected in the Railway Safety Works Fund would be available to be utilised in future to avoid the necessity of new level crossings particularly where such level crossings are expected to have heavy road traffic.

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(Para 312)

CHAPTER VIII—Signalling and Interlocking

(126) The techniques of signalling have advanced today to an extent that it is possible to eliminate the chances of falibility of the human element to a degree not conceived of a few decades ago.

(Para 313)

(127) We remarked in Part I of our Report that the progress in the introduction of modern signalling on the Railways had been slow.

(Para 314)

(128) (i) We find that of the total capital expenditure on the principal categories of developmental works undertaken by the Railways, about five per cent only fell to the share of development in signalling. This, in our view, is inadequate.

(ii) We consider that the imbalance reflects not merely a lack of appreciation on the part of the Railway administrations of the role of modern signalling from the point of view of safety but also a lack of realisation of the fact that unless signalling keeps pace with developments in other fields,

the Railway administrations would be unable to put to the fullest possible use their growing assets.

(Paras 316 and 318)

(129) (i) The hopes which the Railways entertained about the private sector, to whom they had turned somewhat belatedly, developing indigenous manufacture of sophisticated signalling and due to which they forewent development of capacity in a workshop of their own have not materialised. At the same time these expectations seem to have conditioned their thinking so as not to go in for imported equipment.

(ii) We urge that without any further loss of time, a firm plan integrating the requirements of the Railways, the indigenous resources available and the imports needed should be drawn up with boldness and vision for the next five to ten years and the programme of each year should reflect the attention which modern signalling deserves but which it has not quite received in the past.

(Para 319)

(130) We recommend that on sections where electric power is available, colour light signalling should be provided as rapidly as possible.

(Para 321)

(131) We consider that a rigid check should be exercised on the quality of lenses and bulbs used in colour light signals.

(Para 322)

(132) We urge that the Railways explore the possibility of switching over to electric lighting of semaphore signals wherever it is feasible and that economic considerations should not be allowed to stand in the way where the question of improved lighting and visibility of signals is concerned.

(Para 324)

(133) We suggest that a more progressive policy of providing multiple-aspect signalling at stations not only on trunk routes but also on main line routes should be followed.

(Para 325)

(134) As an interim measure, we consider the separation of the warner signal from the outer signal on some sections and placing it at a distance outside the outer signal a step in the right direction but stress that the ultimate objective should be to go in for multi-aspect signalling on such sections.

(Para 326)

(135) (i) We hope that the results of braking distance trials are now available and would soon be reflected in the resiting of signals.

(ii) The minimum sighting distance for the first stop signal without pre-warning in two-aspect lower quadrant territory should be such that the driver is able to observe and obey the signal in time. For a long while now, the need to resite signals has been linked up with braking distance trials. We urge that this matter which seems to have been long delayed should receive the urgent attention of the railway authorities.

(Paras 327 and 328)

(136) (i) We understand that at a cost of a small amount of foreign exchange it would be possible to import suitable reflective material like scotchlite for use on sighting boards. We consider that in matters which involve safety, considerations of foreign exchange should not be allowed to come in the way.

(ii) We think that in addition to sighting boards, such reflective material may be used with advantage on whistle boards, road signs on the approaches to level crossings, speed and caution boards and other indication boards which ordinarily are not lit at night.

(Paras 329 and 330)

(137) We suggest that action should be taken to see that the types of block instruments in use on any one Railway should be reduced to the minimum. It would be advantageous to have one type of block instrument for use on double line and another on single line on each Railway.

(Para 331)

(138) We recommend that panel interlocking with colour light signals may be provided at stations on electrified sections and on such non-electrified sections where electricity is available.

(Para 332)

(139) We recommend that the pace of provision of route relay interlocking should be accelerated not only to speed up operation but also to enhance safety.

(Para 334)

(140) We suggest that in yards provided with large route relay installations, subsidiary signals which serve the purpose of calling-on signals may be provided below the relevant stop signals with post-type telephones to save detentions to trains.

(Para 335)

(141) We find that so far the route relay installations provided at different stations have been of different types having been installed in collaboration with different firms. This arrangement poses serious problems of availability of spares and the need to stock a variety of equipment besides training of staff. In our view, the need for standardisation of designs, specifications and requirements for future installations of this type is paramount.

(Para 336)

(142) We consider that Centralised Traffic Control is an important development to meet the demands of greater safety and efficiency and we hope that in future whenever due to an increase in the density of train service on a single line section the question of creating additional capacity is examined, the case for installation of centralised traffic control would be duly considered keeping in view the additional safety factor which such installation provides.

(Para 338)

(143) We consider that 'train describers' which will simultaneously indicate the direction of movement should form a part of centralised traffic control wherever it is installed.

(Para 339)

(144) (i) We cannot help expressing our doubts whether the Railways are addressing themselves to the task of providing track circuiting with the necessary sense of urgency.

(ii) It appears to us that too much is being made of the shortage of wooden sleepers and that this factor instead of being a source of anxiety has, in course of time, come to be a cause for complacency.

(iii) We feel that the difficulty in regard to the suitability of concrete sleepers in the yards would only apply to a few places and, by and large, it should be possible to overcome such difficulty.

(iv) We have no doubt that with more energetic research and experimentation, it should be possible to evolve suitable alternatives and overcome the hurdles in extending the use of track circuiting.

(Para 344)

(145) We suggest for the consideration of the Railway Board the following guidelines and targets in respect of provision of track circuiting:—

(i) First priority should be given to run through lines at wayside stations on the trunk routes and to all passenger lines at important junctions on both the trunk routes and the main lines. This work should be completed during a period of four years.

(ii) Thereafter run through lines at stations on main line routes and all passenger lines at stations on trunk routes should be track circuited. This should be accomplished in a further period of four years.

(iii) In the last phase, all passenger lines at stations on main line routes and at important junctions on branch lines should be taken up for track circuiting. This work should be completed in another two years.

(Para 347)

(146) Track circuiting must, in our opinion, cater for prevention of side-collisions. With this end in view, in respect of track circuiting works on run through lines in progress at present as well as programmed for the future, the policy should be to track circuit the lines between the block-clearance points. As for the run through lines which have already been track circuited between fouling marks, the work of track circuiting between block-clearance points should be taken up as soon as possible.

(Para 350)

(147) We suggest that the Railway Board should reconsider the question of use of Permali fish plates as insulated rail joints on track circuited sections for high speeds in the light of the reported improvement in the design and strength of Permali fish plates.

(Para 358)

(148) (i) We feel that provision of Automatic Train Control is a matter on which there should be little diversity of opinion. As a means to prevent accidents, it is only second, if even second, in importance to track circuiting

(ii) We consider that the lines on which speeds of 100 km.p.h. or over are permitted should be provided with Automatic Train Control and it should cover all trains including goods trains running on the section. A scheme of priorities should be worked out for trunk routes.

(iii) We are conscious that owing to financial considerations, the installation of Automatic Train Control would have to be proceeded with on a phased basis but the phasing too must be done with a sense of urgency.

(Para 366)

(149) We have been given to understand that the Automatic Train Control equipment being installed in the suburban sections in Howrah area ensures that a driver passing an automatic signal at 'on' must keep the

speed of the train below 15 km.p.h. upto the next automatic signal failing which a warning is sounded for five seconds and thereafter automatic application of brakes takes place. We consider that this type of Automatic Train Control should be extended to other automatic sections in the Bombay, Calcutta and Madras areas.

(Para 368)

(150) We feel that it is high time to undertake research and development in regard to continuous cab signalling, however elaborate or expensive this may be so that a greater degree of immunity from accidents can be achieved on sections on which high speed trains run.

(Para 369)

(151) (i) For items for which the Railways depend on the private sector for supply, the effort should be to encourage more than one reliable source so that not only are the benefits of competition obtained, but an eventuality does not arise where the Railway administration may be left high and dry.

(ii) We understand that in countries like Germany, Japan and France, two or three firms of repute who are prepared to invest money in research and development and who have adequate quality control are given assured orders for manufacture of sophisticated signalling equipment. We suggest that the Railway Board develop their thinking along these lines.

(Para 371)

(152) We understand that qualitatively, the indigenously manufactured conventional signalling equipment has not come up to the required standard. We suggest that the Railway administrations would be well advised to give orders to two or three selected firms of repute so that these firms get interested in maintaining the requisite standards in the manufacture of equipment.

(Para 372)

(153) (i) We were told that often when disconnection notices were presented to the operating staff for disconnecting the gear for maintenance purposes, such notices were not accepted on the plea of heavy train work and the possibility of detentions to trains. The problem assumes great importance at busy stations where the signalling gear is relatively more intricate and needs intensive maintenance.

(ii) We suggest that the whole problem of maintenance of signalling gear should be thoroughly examined and a practicable and safe procedure evolved so that the necessary 'time blocks' are available for the maintenance of signalling gear without much difficulty. Provision for this should in our opinion be made at the time, the time-table of a section is being made.

(iii) By making provision in the train time-table for an integrated maintenance programmes, the maintenance not only of signalling gear but also of track by automotive machine wherever in use and of other overhead installations at stations and on sections could, with advantage, be undertaken in a coordinated manner.

(Paras 373 & 374)

(154) We consider that the inspections of signalling gear should be intensified and the periodicity of testing of signalling gear should be suitably modified.

(Para 376)

(155) We suggest that a copy of relevant notes on joint inspections of signals may be sent to the station for the reference and facility of inspecting officers visiting the station to enable them to see if the defects and deficiencies pointed out in the joint inspection notes have been rectified.

(Para 377)

(156) We understand that a system of radio-patching in conjunction with multi-channel VHF (very high frequency) and micro-wave system is being used in order to improve the efficiency of the control lines and to overcome the difficulties created by the interruption of control circuits. We understand that the Railways have decided to run and man their own line wires instead of depending on the Post and Telegraphs Department. We consider these steps to be in the right direction and hope that these would produce the desired results.

(Paras 380 & 381)

(157) We hope that soon the Railways will be able to develop tele-communication facilities on their system commensurate with developments in other fields as we consider that the fullest use of the assets which the Railways have developed in recent years and are developing can be made only if adequate telecommunications are available.

(Para 381)

(158) In our view, it would be impossible to attain a high standard of safety, efficiency and economy in working if those responsible for sanctioning the introduction of improved signalling methods, through ignorance or otherwise, fail to realise the true potentialities of modern signalling and continue to apply the conventional yardsticks of financial justifiability to safety works. To that extent, the present day concept of financial viability of investment needs to be modified particularly in respect of signalling projects.

(Para 382)

CHAPTER IX—*Motive Power*

(159) (i) We would strongly recommend that the examining fitters at the incoming pit are chosen carefully after testing them in their proficiency and ability to read and write.

(ii) Booking of repairs by the driver and the examining fitter must be spot-checked from time to time by visiting mechanical officers and inspectors and other supervisors.

(iii) The loco foreman too should, in our opinion, be in a position to make spot-checks at least twice or thrice a week.

(Para 385)

(160) We suggest that whenever officers of the mechanical department inspect the incoming inspection pits, they must in particular check the deficiencies in respect of lighting, drainage, cleanliness, availability of tools, etc.

(Para 386)

(161) We recommend that test-checks at the outgoing inspection pit should be intensified.

(Para 387)

(162) (i) We consider it important that there should be no disparity in the concept of repeated bookings as understood by the different Railways. The definition of repeated bookings should be standardised.

(ii) It would also, in our view, be useful if the form of the repeated booking register is standardised for use on all the Railways instead of each Railway following its own system.

(Para 389)

(163) The limited survey which we have made in respect of repeated bookings shows that there is slackness in the sheds in attending to booked repairs. There is considerable scope for improvement.

(Para 391)

(164) We consider that it would be salutary step if data in regard to repairs booked repeatedly in respect of certain selected parts of a locomotive are sent by the Divisional Mechanical Engineer periodically for the attention of the Chief Mechanical Engineer himself.

(Para 392)

(165) The fact that derailments take place due to defective wheels and tyres lends some weight to the assumption that checking and recording of the wear on the tyres is not always done with care. We would emphasise that greater attention should be paid to the gauging of wheels and tyre profiles.

(Para 394)

(166) We suggest that the requirements of loco sheds for provision of wheel lathes should be speedily assessed and such wheel lathes should be provided wherever justified without any loss of time.

(Para 395)

(167) (i) In our view, ultrasonic testing equipment is an essential requirement of each major locomotive shed.

(ii) It is necessary that the intervals at which the exles and journals of locomotives should be ultrasonically tested in the loco sheds is laid down.

(Para 396)

(168) We consider it essential that the training of drivers in the handling of steam locomotives should continue to be pursued with vigour so that steam drivers remain fully accomplished in their basic profession.

(Para 397)

(169) We suggest that a detailed survey of the facilities, equipment and machines, etc. available in and required for each loco shed on a Railway should be made by a senior mechanical engineer of the Railway and effective action should be taken thereafter to make good the deficiencies.

(Para 398)

(170) Since the method adopted by the Northern Railway of maintaining in each loco shed a graph which shows at a glance the position of schedule repairs to locomotives is yielding satisfactory results, we recommend that its adoption on other Railways be considered with such modifications as local conditions may require.

(Para 399)

(171) (i) We are disposed to think that the system of assigning engines, to inspectors of mechanical department, ensuring as it would personalised attention to the locomotives by a nominated inspector, would be conducive to better maintenance.

(ii) We suggest that the Railways on which the system of assigning engines to inspectors of mechanical department does not exist should examine the merits of this system and adopt it if they consider it advantageous.

(Para 400)

(172) We consider it necessary to emphasise that replacements of worn out machines should be effected as expeditiously as possible.

(Para 402)

(173) We suggest that where workshops are not adequately equipped with modern scrag and load deflection testing machines, they should be so equipped without further loss of time.

(Para 404)

(174) We strongly urge that all locomotive workshops should be equipped with proper weigh-bridges.

(Para 405)

(175) We strongly urge that adequate provision should be made in each of the workshops for ultrasonic equipment for the testing of axles.

(Para 406)

(176) We suggest that a periodic evaluation of the efficacy of quality control in the workshops should be done at the Chief Mechanical Engineer's level.

(Para 408)

(177) We emphasise the need for more detailed information being regularly supplied to the workshops concerned in respect of failures of locomotives arising from poor workmanship so that they can adopt proper remedial measures.

(Para 408)

(178) We consider that with a careful study of the present defects and a few minor improvements in the design of reflectors and dimmer switches, it should be possible to ensure that locomotives go out with proper headlights and dimmer switches in working order.

(Para 409)

(179) We urge the Railway Board to standardise the equipment and the facilities required for diesel loco sheds where they have not so far been standardised so that the Railways can thereafter take steps to equip the sheds to the required standard.

(Para 412)

(180) The facilities in the diesel sheds should be such as can compare favourably with the facilities available for maintaining similar assets in other advanced countries.

(Para 412)

(181) We emphasise the need for ensuring that electric loco sheds are equipped with all the necessary machines and plant from the beginning if maintenance of a high standard is to be attained.

(Para 415)

(182) We understand that a committee of senior officers has been appointed to go into the question of standardising the machinery and plant to be provided in electric loco sheds. We consider it a step in the right direction.

(Para 416)

(183) We urge that energetic steps may be taken to see that a more suitable and reliable type of speedometer-cum-speed recorder is manufactured indigenously for use on locomotives.

(Para 420)

(184) We suggest that either the speedometer on metre gauge diesel locomotives should be repositioned on the control desk or alternatively another speedometer may be provided so that the driver can refer to it conveniently.

(Para 421)

(185) So long as the VDO type speedometers are in use on diesel locomotives, it is suggested that a direction corrector should be fitted.

(Para 422)

(186) We recommend that a detailed technical survey of defective speedometers and the intervals at which the components require attention in the workshops should be made and on the basis of this survey remedial measures evolved so that a target for servicing of speedometers not oftener than once a year can be achieved.

(Para 423)

(187) We suggest that within the shortest possible time, all diesel and electric locomotives should be equipped with the driver's vigilance device.

(Para 430)

(188) All new motive power units manufactured at Diesel Locomotive Works and Chittaranjan Locomotive Works should be fitted with this device before being sent out to the Railways.

(Para 430)

(189) We suggest that while the process of installation of the driver's vigilance device is continuing, the administration should take steps to carry the staff with them in regard to the utility of the device.

(Para 431)

(190) We recommend that anti-slip devices provided on diesel and electric locomotives should be frequently checked for their efficient functioning.

(Para 436)

(191) We suggest that both the indications, i.e. visual as well as audible, should be provided on diesel locomotives to give an indication of wheel slip.

(Para 436)

CHAPTER X—Goods and Coaching Stock

(192) The examination and maintenance of wagons and coaches has an important bearing upon the standard of safety in railway operation.

(Para 437)

(193) We have been advised that a uniform time schedule for different types of train examination is being laid down on the basis of which gangstrengths in different yards will be determined by the Railways taking into account the number of trains dealt with in these yards. We welcome this decision and hope that its early implementation will remove the complaints voiced by officers and staff about inadequate time allowance for examination, insufficient gangstrengths, skipping of repairs, etc.

(Para 438)

(194) We are of the view that if the Andal pattern of train examination has proved efficient, economical and useful, it should be extended to other important train examining centres. We suggest that difficulties, if any, in its adoption at other places should be overcome.

(Para 439)

(195) We consider that the maintenance of goods rolling stock merits no less importance than yard operation and the occasions on which recourse should be had to the provision for curtailment of time for train examination in exceptional cases should be few and far between.

(Para 440)

(196) (i) Though some Railways have issued instructions in book form for the train examining staff, it seems that some confusion still exists in the minds of staff, particularly about safe-to-run examination.

(ii) We suggest that the scope of each type of train examination given to goods rolling stock should be clearly defined for the guidance of the staff and the components to be examined and checked, spelt out and incorporated in the rules.

(Para 441)

(197) We suggest that apart from 'defect investigations' which are undertaken by the RDSO off and on in respect of components which are reported to fail frequently, the design of goods rolling stock, particularly IRS wagons, should be examined by the RDSO or by a Committee of technical officers to see if there are any inherent defects and if any modifications are necessary in view of the higher speeds being planned.

(Para 442)

(198) We consider it essential that the staff concerned with the examination of wagons should be educated in respect of the incidence of derailments caused by the various defects and their consequences in order to provide motivation for a higher standard of workmanship.

(Para 443)

(199) It is also necessary to provide the essential gadgets for examining the various components and to train the examining staff in their use.

(Para 443)

(200) As regards the carrying out of repairs in traffic yards, we think that a satisfactory solution lies in identifying the repairs to be carried out on trains and in traffic yards, standardising the pre-requisites for the proper carrying out of such repairs and then ensuring that the pre-requisites are available.

(Para 444)

(201) We consider it important that taking into consideration the nature and extent of repairs to be done, the facilities and equipment in each sickline should be surveyed and the deficiencies made good.

(Para 445)

(202) The provision of wheel lathes, ultrasonic testing equipment and burnishing machines in the major sicklines will enhance the standard of maintenance of rolling stock in the sicklines.

(Para 446)

(203) (i) In our view, the stage at which each wagon goes for normal axle box repacking is the occasion when the wagon should receive full attention and be turned out in as perfect a condition as possible, viz. with all the defects rectified.

(ii) Checks on the wagons coming out of the sicklines after repacking should be greatly intensified as, in our view, the standard of repairs given

to the wagons would depend on the measure of supervision and inspection at this stage.

(Para 447)

(204) (i) We strongly urge that energetic steps should be taken to ensure the provision of adequate numbers of washing lines and pit lines with the necessary facilities so that each rake is properly examined and maintained on the washing line or pit line.

(ii) We also consider it necessary that there should be timely placement of rakes on the pit lines to facilitate examination of wheels and undergear.

(Para 451)

(205) (i) We find that the percentage of coaches marked sick and detached at stations enroute and at terminal stations other than primary or secondary maintenance stations to the total number of coaches marked sick was 6.2 on the broad gauge and 8.1 on the metre gauge from April, 1967 to September, 1968.

(ii) We emphasise that attention to coaches at primary and secondary maintenance centres should be intensified in order to reduce the overall percentage of sick coaches.

(Para 454)

(206) (i) Running gear defects, viz. hose relating to axle boxes, bogie frames, spring suspension and brake gear accounted for the highest percentage of the total number of defects on both the broad and the metre gauges. The incidence of damage-labelling on this account was higher on certain types of coaches than on others.

(ii) The percentage of coaches damage-labelled due to wheel defects was also on the high side on both the gauges, particularly in respect of ICF coaches on the broad gauge.

(iii) We emphasise the need for greater attention to coaches at the maintenance depots. We also suggest that a broad analysis of defects which result in damage-labelling of coaches should be made at regular intervals and disseminated to the staff.

(Para 455)

(207) (i) We urge that a detailed analysis of the causes of electrical defects be made and remedial measures taken to bring down the incidence of sick coaches on this account on all gauges.

(ii) We consider that it would be useful if the staff are made aware of the results of the analysis with a view to improving the standard of examination and maintenance of electrical installations in coaches.

(Para 456)

(208) We suggest that fuses should be provided on both the positive and negative wiring in steel bodied coaches.

(Para 458)

(209) (i) We suggest that the checking of earth leakage with the help of test lamps should be intensified and carried out at the time of both primary and secondary maintenance of carriages.

(ii) We suggest that the observance of these checks should be watched both at the divisional and headquarters' level.

(iii) Spot checks by electrical engineers and supervisors to ensure that testing is carried out properly would, in our view, prove highly advantageous in toning up the quality of work done by staff.

(Para 459)

(210) We suggest that a system for investigation of failures of certain selected carriage and wagon components be evolved on lines comparable to the investigation which is done at present in case of engine failures.

(Para 460)

(211) We are glad to know that 'defect investigations' in respect of the design of certain components are carried out by the RDSO and modifications are issued as and when necessary. While this is indeed a continuous process, we suggest that results of investigations and recommendations made by the RDSO should be uniformly disseminated to all Railways for appropriate action.

(Para 463)

(212) (i) It is the Railway Board who should issue instructions regarding modifications setting out the target dates for carrying them out and call for periodical progress reports.

(ii) We are strongly of the opinion that the whole process of issue of modifications by the Railway Board and thereafter the execution at the Railways' level needs to be streamlined if the effort and thought which go in ordering such modifications for enhancing safety are to serve any useful purpose.

(Paras 465 and 467)

(213) It is suggested that equalising beams which fail in service should be replaced by those manufactured to RDSO's drawing and specification from Class II steel and safety clamps should be provided as suggested by the RDSO.

(Para 473)

(214) (i) We find that at present if the bearing spring of a BOX wagon on a train breaks, the train is permitted to proceed at a restricted speed to the next train examining station with the broken spring clamped. We consider that the appropriate course would be to detach the wagon with a broken spring at the station where this defect is detected and to summon the train examining staff for replacement of the spring.

(ii) It is also suggested that the plates for the springs may be made from silico-manganese steel instead of the present specifications to reduce the incidence of breakage.

(iii) It is essential that a satisfactory solution to the problem of over-loading of BOX wagons with minerals should be found to reduce the incidence of breakage of springs.

(Paras 479 and 480)

(215) We asked for information regarding progress of implementation of ten selected recommendations in the report of Director, Research (Hot Boxes). We do not feel heartened by the progress of the implementation of these recommendations and urge that energetic action may be taken to implement the recommendations.

(Paras 482 and 483)

(216) We recommend research and study to develop a hot box detector for use on the Indian Railways.

(Para 484)

(217) We strongly urge that whatever measures are needed to cause Jessops to fulfil the order placed on them in respect of EMU coaches be adopted.

(Para 485)

(218) We hope that with the increase in the capacity for periodical overhaul the back-log in the periodical overhaul of EMU coaches on the Central Railway would be cleared.

(Para 486)

(219) (i) We are of the view that the directives in regard to the prescribed percentages of effective vacuum cylinders on trains must be observed uniformly on all the Railways.

(ii) The number of effective cylinders on a train must be a special point of check by the neutral control examiner.

(iii) It is of the greatest importance that the staff who are actually to operate the train know the real position in regard to the brakepower available on the train.

(iv) It is essential that the requisite brakepower should be available on all trains and difficulties arising either on account of defective material or other factors should be overcome.

(Para 492)

(220) We are of the view that endeavours should be made to improve the safety factor in respect of trains running on narrow gauge sections. Locomotives, carriages and wagons should be equipped to the extent possible with vacuum brake apparatus and where this is not possible, alternatives should be evolved as for instance introduction of rail cars, etc. Reliance upon hand brakes for the safety of trains is, in our view, not only out-moded but also hazardous.

(Para 493)

(221) We hope that a satisfactory solution would be evolved in regard to the difficulty of stopping diesel hauled goods trains as the application of the vacuum brake in the brakevan gives little or no indication to the driver.

(Para 494)

(222) We suggest that on all anti-telescopic coaches, an identifying mark or code should be inscribed for the guidance of the operating staff so that in the event of stock of both types being available, the staff marshal anti-telescopic coaches in preference of other steel bodied coaches.

(Para 495)

(223) (i) We suggest that the spring suspension system of the broad gauge four-wheeler brakevans should be redesigned to provide comfortable riding at speeds of 75 km. p.h. or more.

(ii) We also suggest that the suspension arrangements of the metre gauge four-wheeler brakevans should be investigated with a view to improving their riding.

(Para 496)

(224) We hope that effective steps will be taken to provide adequate capacity in the New Bongaigaon workshop for periodical overhaul of coaches.

(Para 497)

(225) (i) It is essential that the percentage of goods stock overdue periodical overhaul on the Western Railway should be reduced considerably.

(ii) The need for regulating the flow of coaches into the workshops for periodical overhaul on the Central Railway is emphasised.

(Paras 498 and 499)

(226) The need to equip every carriage and wagon workshop with adequate ultrasonic testing equipment for testing axles and also equalising beams of IRS metre gauge coaches cannot be over-emphasised.

(Para 500)

(227) We suggest that special efforts should be made to procure burnishing machines for the workshops.

(Para 500)

(228) We recommend that a periodical analysis of all cases of roller bearing failures on coaches and wagons indicating date, year and station of mounting, particulars of last attention given, cause and responsibility, etc. should be made so that remedial action, if required, can be taken.

(Para 503)

(229) We suggest that the Research, Designs and Standards Organisation should go into each case of failure of roller bearings and analyse every aspect including materials used and the manufacturing accuracies and suggest remedies. We attach utmost importance to this matter in view of the increasing use of roller bearings on Indian Railways.

(Para 504)

(230) We consider it important that all carriage and wagon workshops are provided with suitable and adequate facilities for over-hauling of roller bearing axle boxes at the time of periodical overhaul or whenever such axle boxes are sent to the workshops. It is also essential that the workshops where roller bearing axle boxes are attended to have dust-proof facilities.

(Para 505)

(231) We invite the attention of the Railway Board to the type and manner of attention to roller bearings in workshops on the Japanese National Railways. It seems to us that the adoption of a similar system will be of advantage to the Indian Railways.

(Para 506)

(232) We suggest that a programme should be drawn up to replace the outdated or overaged machines in the workshops on a phased basis.

(Para 507)

(233) We urge that measures should be taken to see that coaches are in perfect condition when offered for examination after periodical overhaul. Steps should be taken to improve the standard of workmanship to minimise the percentage of rejections.

(Para 508)

(234) (i) We feel that neutral control examination serves as a further check and has been generally useful in keeping wagons in good fettle and we consider that nothing should be done to weaken it in view of its independent character.

(ii) We consider that in view of the changing pattern of traffic, neutral control examination need not necessarily exist at the boundary points of

the Railways as used to be the case in the past. The Railway Board should examine the existing set-up of neutral control examination and decide upon the various points at which it should be located.

(Para 509)

(235) (i) We are of the view that there is need for revision of Conference Rules Part III. The rules contained in this publication should not only provide comprehensively for the examination and repair of all types of stock which have been introduced on the Indian Railways over the past several years but the provisions having a direct bearing on safety in railway operation as distinct from those simply meant to keep the coaches and wagons in good fettle should be clearly specified. We understand that the Railway Board have under scrutiny a draft prepared by the IRCA for the examination of all types of coaching stock.

(ii) In order to reduce the incidence of derailments due to carriage and wagon defects, the neutral control examination should lay greater emphasis on the compliance of safety rules and regulations in the matter of maintenance of stock.

(Para 510)

(236) The Indian Railways Conference Association publishes annually a 'Report on the broad and metre gauge wagon pools and neutral control of wagon examination' which includes the results of the surprise checks conducted by the neutral control flying squads. We suggest that the report should clearly specify the percentage of wagons found unsafe-to-run to the total number of wagons checked.

(Para 511)

(237) In view of the large proportion of overaged locomotives, coaches and wagons which will have to be kept in use during the Fourth Five Year Plan due to smaller allocation of funds in the Plan, we think that special attention will have to be given to such stock during periodical overhaul as well as during day-to-day maintenance. Periodical overhaul to such stock may have to be given at shorter intervals to keep them road-worthy and safe for operation. We urge the Railway Board to give serious consideration to this matter.

(Paras 513 and 515)

CHAPTER XI—Stores

(238) We had, in Part I of our Report, referred to the fact that considerable time and energy of the executive officers is spent in chasing after the procurement of items of spare parts and stores which are in chronic short supply. The position as indicated by the evidence tendered before us in regard to the supply of such stores seems even worse than we had thought.

(Para 516)

(239) It is of vital importance that to maintain locomotives, rolling stock, signalling equipment and permanent way to prescribed standards, the supply lines that convey spare parts and stores from the supplier to the ultimate user keep moving with clock-work precision.

(Para 516)

(240) The policy in regard to imports of vital parts required for maintenance of valuable assets as also the procedure of release of foreign exchange needs to be thoroughly reviewed so that not only is the foreign

exchange utilised to the best possible advantage but also the short-sighted policy of saving some little foreign exchange at the cost of keeping valuable assets idle is avoided.

(Para 521)

(241) The chimerical impression which the compliance percentages of 90 to 95 evoke is apt to prevent the focussing of the administration's attention on the need to streamline their supply lines apart from the smugness which these percentages induce in the Controllers of Stores of which we found a fair amount of evidence.

(Para 521)

(242) (i) Complaints were voiced constantly about the inferior quality of tools, stores and spare parts such as adjustable spanners, screw drivers, bulbs, battery material, rubber rolling rings and other rubber fittings, etc. We were shown certain spare parts and components which though brand new could not be put to use as they were either of the wrong size or they did not match with the components in conjunction with which they were supposed to be used.

(ii) We have no doubt that the inferior quality of tools, stores and spare parts, apart from turning out to be false economy in the end is highly frustrating inasmuch as it throws additional burden on the staff in the performance of their duties and renders the work of repairs and maintenance more onerous. In many instances where due to the unreliable quality of spare parts, shoddy repairs are effected, safety too would be at stake.

(iii) It would be more prudent and economical to provide tools, stores and spare parts of the requisite quality readily identifiable and covered by adequate guarantees by paying a proper price in the beginning.

(Para 527)

(243) We had occasion, in Part I of our Report, to refer to over-emphasis in accepting the lowest tenders due to the fear in the purchasing authority of criticism which may be engineered by the rejected tenderers. We reiterate that the administration should endeavour to insulate its purchasing officers from such criticism if it is satisfied that the discretion was exercised for good and sufficient reasons.

(Para 528)

(244) We consider that as a rule all tools and spare parts must have the manufacturers' markings on them.

(Para 529)

(245) We had, in Part I of our Report, referred briefly to difficulties which are being experienced in respect of items procurable through the Directorate General of Supplies and Disposals. We have examined in some detail the procedure for, and the position in regard to, the procurement of stores through the agency of the Directorate General of Supplies and Disposals. We find that—

- (i) Despite the enormous industrial advancement made in the country during the last two decades and the improved materials management methods which are being employed everywhere, the time intervals for processing of indents and procurement of stores have remained more or less unaltered. Their continuance in the present form is, in our view, unjustified.
- (ii) It is unrealistic to expect an organisation as complex as the Railways which has been developing at a fast pace and undergoing modernisation to assess its requirements of stores 24 months ahead. Furthermore, factors like an ever-increasing and

yet changing pattern of traffic which is closely linked up with the growth of industrial activity in different parts of the country, and the unpredictable law and order situation in the country which on the Railways is reflected in the wide-spread incidence of thefts of railway material and cases of vandalism, make precise forecasting of requirements in any event difficult but with a procedure which prescribes a lead time of two years make things impossible.

- (iii) The position is depressing both in respect of the coverage of indents and the materialisation of supplies. Not only was a very low percentage of the indents covered in time, but the extent of delays in the supplies on the basis of originally prescribed delivery periods ranged from 1 to 20 months. In addition to these delays the supplies against several contracts for which the original delivery dates had expired, in some cases years ago, still remained outstanding.

(Paras 531 to 541)

(246) We express our keen disappointment over the delay in procurement of railway equipment and stores through the agency of the Directorate General of Supplies and Disposals.

(Para 542)

(247) We are of the view that the functions of purchase cannot be divorced from the allied functions of standardisation, control on inventory, value analysis and control on consumption. Scientific materials management is possible only if the function of purchase is integrated with the other functions of materials management.

(Para 544)

(248) It appears to us that too much has been made of the benefits resulting from bulking and that too little attention has been paid to disadvantages inherent in the system of procurement of stores through an agency not involved in the running of the Railways. In our view, the disadvantages in the system clearly outweigh the advantages.

(Para 545)

(249) (i) We are clear in our minds that responsibility for the procurement of stores should rest squarely with the Railway Board and the Railway administrations without bringing into the picture the agency of the Directorate General of Supplies and Disposals.

(ii) We think that this will lend stability, permanence and continuity to the procurement of railway equipment and stores and would impart a greater sense of urgency to the officers of the Railways entrusted with the responsibility of materials management.

(Para 546)

(250) We have been assured by the Railway Board that they have the basic organisation to replace the agency of the Directorate General of Supplies and Disposals for procurement of their own stores and would be in a position to take this job over. We consider that this is a matter which can brook no further delay.

(Para 547)

(251) We think that with the transfer of the functions of the Directorate General of Supplies and Disposals to the Railway administration, some reorganisation of the existing system and streamlining and simplification of the procedure relating to procurement of stores will be necessary to meet the growing requirements of the Railways.

(Para 547).

(252) We find that over the years, while the levels of prices of materials on the one hand and of the consumption of stores on the other have been rising steadily, the powers of purchase vested in the Controllers of Stores have not kept pace.

(Para 548)

(253) We consider that the following suggestions made to us deserve most careful consideration--

- (i) The powers of purchase of Controllers of Stores should be raised to Rs. 50,000 or even Rs. 1,00,000 from the existing limit of Rs. 25,000 with suitable increase in the powers of other purchase officers. The limits of purchase through 'single tender' and in case of cash purchase should be suitably enhanced.
- (ii) Finance need not be associated for purchase upto Rs. 10,000 and in case of purchases in which the value exceeds Rs. 10,000 the stages of consultation with Finance should be confined only to assessment of quantity, association on tender committee and issue of contract.
- (iii) There is need to develop a proper buyer-seller relationship in respect of safety items of stores so that the seller becomes more committed and has a greater stake in his dealings with Railways. For a tie-up of this nature, an assurance to one or two firms in respect of each important item that the requirements would be bought from them for a specified period may be necessary.

(Para. 549)

(254) We feel that the powers of purchase of stores at all levels should be kept under constant review by the Railway Board so that they are adequate to cope with the ever-increasing needs.

(Para 550)

(255) We are of the view that it may be possible to decentralise the stores organisation in a manner that the advantages of having stores depots contiguous to the consuming centres are derived without subjecting the system to disadvantages arising out of larger inventories.

(Para 552)

(256) We had, in Part I of our Report, stressed the need to adopt scientific methods of inventory control and modern materials management techniques. We consider that for effective and efficient materials management and the solution of various complicated problems the Railways would do well in seeking specialist guidance from quarters who have the requisite expertise in materials management.

(Para 553)

(257) (i) We consider that materials management today is a specialised job. Over dependence on ill-qualified ministerial staff would create problems for the stores organisation rather than solve them.

(ii) We have no doubt that the recommendations of the committee of the Controllers of Stores appointed to go into the reorganisation of the stores department would go a long way in improving the stores organisation.

(Para 554)

CHAPTER XII—*Theft, Vandalism and Sabotage*

(258) Theft of railway equipment and vandalism on the Railways are a serious problem from all accounts. Not only is theft of copper wire widespread on the Railways but the evil extends to components of locomotives,

coaches and wagons and electrical equipment having even a small copper or brass element.

(Para 555)

(259) We consider that the Railways should have a registered mark for railway materials and parts on which such mark can be imprinted as this would obviously make it possible to take effective action against persons in unlawful possession of railway property under the Railway Property (Unlawful Possession) Act.

(Para 557)

(260) We feel that cases of wilful tampering with track do not receive from the State police and the other authorities concerned with law and order the attention that they deserve.

(Para 564)

(261) (i) We find that accidents due to sabotage have been increasing during the last 15 years and the action taken to trace the culprits has been largely ineffective.

(ii) We do not agree with the Ministry of Home Affairs that prevention of accidents due to sabotage is a matter which may be left to be tackled by the Railway Ministry themselves. It appears to us that if the problem were viewed only from the viewpoint of percentage of train accidents attributable to sabotage, it is apt not place the gravity of accidents resulting from sabotage in correct perspective.

(iii) We urge the Ministry of Home Affairs to ask the State Governments to take adequate measures to apprehend and prosecute the culprits successfully. Prevention of sabotage falls wholly and solely in the jurisdiction of the State police.

(Para 565)

(262) The Additional Commissioner of Railway Safety is a technical and highly experienced officer independent of the Railway administration and when after due investigation he comes to the conclusion that an accident was due to wilful tampering with track, the State Police authorities should ordinarily be guided by the results of these investigations.

(Para 566)

(263) In the event of a difference of opinion between the State police and the Commission of Railway Safety in regard to whether the accident was due to sabotage, the Railway administration should not allow the matter to rest at that but should pursue this with the State Government at a higher level.

(Para 566)

(264) We feel that there is need for suitably amending Section 12 of the Railway Protection Force Act, 1957 and Section 126 of the Indian Railways Act, 1890 in order that a person indulging in theft or destruction of railway property or in wrecking or attempting to wreck a train can be arrested and proceeded against with a reasonable chance of success.

(Para 570)

(265) We stress that the menace of theft of and tampering with railway equipment is too serious to be treated merely as an ordinary law and order problem as it adversely affects safety in railway operation.

(Para 570)

(266) (i) It appears to us necessary that steps should be taken to educate public opinion and to rouse the social conscience of the people as to the heinous nature of the crime of sabotage and of activities like vandalism

and theft of railway material which result or may result in serious disasters involving loss of life of innocent persons travelling on the railway.

(ii) We make a special appeal to the public men, the educationists and the press who have the opportunity and responsibility of moulding public opinion to do their duty in this connection.

(iii) We feel that the Railway Ministry and the State Governments should keep in mind the necessity of such an approach all the time.

(Para 571)

CHAPTER XIII—The Commission of Railway Safety

(267) Under the law, the Railway Board are the Safety Controlling Authority. The responsibility for safe operation of railways, thus, rests with the Railway administration. That responsibility cannot be shared by officers of the Commission of Railway Safety.

(Para 576)

(268) We have been assured by the Commissioner of Railway Safety that full cooperation and assistance of every kind is given by the Railway administration to the Commission of Railway Safety.

(Para 581)

(269) We consider that in cases in which the Additional Commissioner of Railway Safety is unable, due to preoccupation or otherwise, to hold an inquiry into a serious accident and requests the Railway administration to arrange for a departmental inquiry, it should be sufficient if he expresses his views on the findings and the recommendations made where he agrees with the findings of the departmental inquiry, instead of preparing his own report.

(Para 588)

(270) (i) We are of the view that the Additional Commissioner of Railway Safety should inquire into certain types of accidents which are not at present provided for under the rules. We have in mind, in particular, two types, namely, (a) accidents at manned level crossings involving collisions between trains—whether goods or passenger—and road vehicles in which there is loss of life or grievous injury to passengers in the road vehicles and (b) collisions and derailments of goods trains in which there is loss of life or grievous injury to any person.

(ii) The Additional Commissioner of Railway Safety must also make such other inquiries into serious accidents as the Commissioner of Railway Safety considers necessary for him to inquire into.

(iii) The Commissioner of Railway Safety himself may, if he considers fit or if his Minister so requires him, make inquiries into accidents of a very serious nature.

(Paras 594 and 595)

(271) (i) We consider that the recommendations made by the Additional Commissioners of Railway Safety should be incorporated as an integral part of the accident inquiry report under the heading 'Remarks and Recommendations' instead of being an annexure to the Report.

(ii) We suggest that line plans showing essential features and photographs, where necessary, should be appended to such accident inquiry reports.

(Para 596)

(272) In our view, a period of 60 days from the date of accident should ordinarily suffice for the final report to be sent by the Commissioner of

Railway Safety to the Railway Board and the Railway administration.

(Para 597)

(273) (i) From the safety point of view, inspections by Additional Commissioners of Railway Safety are no doubt advantageous.

(ii) The reports of inspections by Additional Commissioners of Railway Safety should be forwarded directly to the Railways concerned and copies may be sent to the Commissioner of Railway Safety and the Railway Board.

(Paras 602 to 604)

(274) It seems to us definitely advantageous that the Commission of Railway Safety remains attached to another Ministry so that its position as a body independent of the Railway Board would be, and remains, quite clear to the public.

(Para 608)

(275) We have noted that during the past nearly three decades the Commission of Railway Safety has been attached to different Ministries from time to time depending upon the reshuffling of portfolios and jurisdiction of various Ministries. We recommend that from now on the Commission of Railway Safety should find a permanent anchorage and that this should be with the Ministry of Home Affairs.

(Para 609)

(276) We feel that the manner in which the draft report is at present dealt with robs it of objectivity and independence and, furthermore, results in unnecessary delays in finalising the report.

(Para 610)

(277) (i) We are of the opinion that the responsibility for compiling the report of an accident inquiry should be placed squarely on the Additional Commissioner of Railway Safety concerned.

(ii) It is the final report which should be sent by the Commissioner of Railway Safety to the controlling Ministry, the Railway Board and the Railway administration concerned.

(Para 610)

(278) In case there is any difference of opinion between the Commissioner of Railway Safety and the Railway Board or the Railway administration with respect to the conclusions or the recommendations in the report, the difference would have to be ironed out in a conference between the Commissioner of Railway Safety and the Railway Board in such manner as they think fit.

(Para 610)

(279) (i) We do not see the merit of an arrangement whereby the rules for conducting of inquiries by the Additional Commissioners of Railway Safety are made by the Ministry of Railways.

(ii) We suggest that from now on whenever any changes in the present rules are required these should be considered and issued by the Ministry controlling the Commission of Railway Safety. This Ministry may, when necessary, consult the Railway Board while framing such rules.

(Para 612)

(280) We are of the opinion that it would inspire public confidence in the independence of the Additional Commissioners of Railway Safety if the public including trade unions and the press are admitted to the inquiries. They would, of course, have no say in the inquiry itself but may

be present only as observers at the stage when the Additional Commissioner of Railway Safety takes oral evidence of witnesses.

(Para 613)

(281) (i) The accident inquiry report intended for publication should be available to the Press soon after its finalisation.

(ii) If prosecution is decided upon in a particular case the publication of the report may be withheld.

(Para 614)

(282) It is necessary that the entrants to the Commission of Railway Safety should understand clearly that once they opt for the Commission and are selected, they would not revert to Railway service. The Ministry of Railways should have no further say in regard to their career.

(Para 615)

(283) We expect that if the steps that we have suggested for securing the independence of the Commission of Railway Safety are taken, an inquiry by the Additional Commissioner of Railway Safety will inspire sufficient public confidence and a 'judicial' inquiry on the Indian Railways would, in course of time, become a rare thing.

(Para 616)

(284) We suggest that the present strength of Additional Commissioners of Railway Safety may be increased from five to seven. The jurisdiction of the various circles is a matter to be determined by the Commissioner of Railway Safety in consultation with the Ministries concerned. Meanwhile, the fifth circle referred to in Para 586 of Chapter XIII, which has hitherto been continuing as temporary, may be made permanent.

(Para 617)

(285) It seems to us that the field for recruitment to the Commission of Railway Safety should be widened and there should be no bar to officers of the Railways from departments other than the Civil Engineering, namely, mechanical, operating and signal engineering being selected. We would like to add that the selection of officers should be in consultation with and on the recommendation of the Commissioner of Railway Safety.

(Para 618)

(286) We suggest a pyramid structure of grades for officers of the Commission. In our view, volunteers should be invited from among officers in the Junior Administrative Grade.

(Para 619)

(287) (i) The seniority of officers in the Commission of Railway Safety should be counted from the date of service in the Commission itself.

(ii) After an officer has joined the Commission of Railway Safety, there should be no question of any further selection as far as grades upto Rs. 2,000—2,500 are concerned.

(iii) The selection for the post of Commissioner of Railway Safety should be confined to the officers of the Commission of Railway Safety and no outside railway officer should be imported for this purpose.

(Para 620)

(288) We are convinced that the Commissioner of Railway Safety should have the appropriate secretariat status which in this case would be that of an Additional Secretary to the Government of India.

(Para 621)

(289) It is a matter of regret that when the salary of General Managers was raised in September, 1965, the salary of the Commissioner of Railway Safety was not correspondingly raised as it should have been at the same time. We recommend that this matter should be rectified without delay.

(Para 624)

(290) While we appreciate the considerations that led the Commissioner of Railway Safety to suggest a shift of the office of the Commission to Secunderabad, it appears to us desirable that the office of the Commissioner of Railway Safety should be located at New Delhi.

(Para 629)

(291) The Headquarters of the Additional Commissioners of Railway Safety should be at the headquarters of the zonal Railways, except where the jurisdiction of the Additional Commissioner of Railway Safety extends to more than one Railway in which case it should be at the headquarters of one or the other zonal Railway.

(Para 630)

(292) The annual report on the working of the Railway Inspectorate should continue to be placed on the tables of both Houses of Parliament.

(Para 631)

CHAPTER XIV—*The Research, Designs and Standards Organisation and its future role*

(293) We set out the role and the various facets of activities of the RDSO, as we visualise them.

(Para 636)

(294) We were told that efforts of the Organisation in farming out problems of basic research to the National laboratories, Institutes of Technology or research institutions had not met with much success.

(Para 640)

(295) We suggest that with a view to obtaining better coordination with the fundamental research institutions, laboratories and institutes of technology, the Director General, RDSO, or his representative should be, in an ex-officio capacity, on the governing councils of those of the National laboratories and institutes on whom the RDSO has to lean heavily for the solution of its basic research problems.

(Para 642)

(296) (i) The RDSO should concentrate on problems of applied research which may refer to the evolving of ways and means to improve the existing equipment and services or developing of new forms or systems.

(ii) We consider that in the matter of applied research, priority should, for some time to come, be given to problems which are susceptible of at least a partial solution within a period of two to three years over the relatively long-term research projects.

(Para 643)

(297) (i) A conspicuous example of a problem needing immediate solution is the designing and standardisation of signalling relays on which modern signalling depends so much and which are essential for progressing such works.

(ii) We understand that a beginning has been made by setting up a Relays Cell in the RDSO but we consider it necessary to accelerate the pace considerably so that relays suitable for our purpose and using indigenous materials to the maximum extent can be developed.

(Para 644)

(298) It would, in our opinion, be useful to make a quantitative assessment of where and what safety facilities should be provided on the various Railways and to what extent safety could be improved by doing so.

(Para 645)

(299) We think that greater reliance will have, in future, to be placed on methods of Operations Research if the ultimate objective of the research organisation is to maximise efficiency, safety and long-term economy.

(Para 646)

(300) We are of view that designing and development of machines for special purposes which cannot be purchased as off-the-shelf items from the trade should be a continuous activity of the RDSO.

(Para 648)

(301) In our view, adequately equipped sections of the RDSO should be located at the manufacturing units like the Locomotive Works at Chittaranjan, the Integral Coach Factory at Perambur and the Diesel Locomotive Works at Varanasi.

(Para 649)

(302) (i) We suggest that efforts should also be made to attract the best Indian talent for design work from all sources and to encourage the designing of improved jigs and tools for railway workshops and better planning of equipment and plant layout for workshops, loco sheds, sicklines, stations, etc.

(ii) We have in view the specialist consultancy service which the RDSO should provide in the designing and equipment of such depots. It is not our intention that the Design Wing of the RDSO should function as a general-purpose drawing office at the beck and call of the Railways and we would like the RDSO to guard against this.

(Para 649)

(303) We consider it useful that some sections of the standards wing of the RDSO should be located in the Railway Board so that complete sets of standard specifications and drawings can be readily available on demand and references regarding these can be disposed of speedily.

(Para 650)

(304) We suggest that the expert technical Standards Committees should invite representatives of the Commission of Railway Safety and some manufacturers of railway equipment on a selective basis to participate in their deliberations.

(Para 650)

(305) (i) We would like to bring into sharp focus the rapid progress being made by advanced countries in the development of signalling and tele-communication, particularly the use of such items as axle counters, train describers, hot axle detectors, electronic track circuits, and automation in marshalling yards, improved communication methods like message dialling and microwave.

(ii) It has been represented to us that adequate attention has not been paid to investigating problems concerned with signalling and telecommunication peculiar to the Railways or to strengthening the telecommunication network on the railway system. We feel that there is great scope and urgent need for work of this nature in the RDSO and we would urge that this receives its due share of attention.

(Para 651)

(306) (i) We are in favour of tests and inspections which are made by the RDSO at the specific request of the zonal Railways, the Railway Board or the Commission of Railway Safety. We would suggest that a suitable organisation may be created in the RDSO so that such requests can be dealt with without causing interference and interruption in the other regular approved programmes of the RDSO.

(ii) The inspection of material manufactured in the signal and telecommunication workshops should, in order to ensure uniform quality, be entrusted to the RDSO.

(iii) We understand that inspection of electrical signalling equipment manufactured by the various firms is already undertaken by the RDSO but only a small percentage of production is inspected as a test check. In the present state of development when a number of firms are entering the field and when those already in the field are taking to new items, it is essential that a much larger proportion of electrical signalling equipment is inspected both at the manufacturing stage and at the assembly stage.

(iv) The inspection organisation of the RDSO should, if required, be suitably strengthened to perform these essential functions.

(v) It appears to us that the inspection units could with advantage be located at Calcutta, Bombay, Madras etc.

(Para 652)

(307) (i) We understand that the RDSO have been acting as consultants to the State Trading Corporation and the wagon building industry. We would like to commend the RDSO on this expanding role and would urge that technical consultations should be provided in full measure to these important clients.

(ii) We suggest that such consultation as may be asked for by the Commission of Railway Safety should be made readily available.

(Para 653)

(308) We consider that with the expanding band of competent officers and staff and with the growing knowledge and expertise which the RDSO is steadily acquiring, rendering of consultancy services by the RDSO would progressively increase and more and more confidence will be placed in its technical advice.

(Para 654)

(309) We consider that the details of projects to which the RDSO should apply itself in future is a matter which would have to be left to the RDSO under the guidance of the Railway Board and the Central Board of Railway Research keeping in view the requirements and priorities which may arise from time to time.

(Para 655)

(310) We mention a few subjects whose urgency strikes us as pressing:—

(i) With the increased speeds of rolling stock and the introduction

of fast non-stop trains the subject of vehicle dynamics has assumed great importance. Research on the various aspects of riding quality of rolling stock from the viewpoint of both safety and comfort as also stress analysis on vehicle structures and important components would have to be pursued, and if necessary, expanded. This research must be suitably dovetailed into a wide-range study of derailments to establish guidelines for designs and maintenance practices which are conducive to greater safety.

- (ii) The problem of seizure of roller bearings in fast non-stop trains particularly when the conventional method of station staff watching out for an overheated axle box from the station platform is no longer applicable appears to call for an urgent study and solution.
- (iii) It is necessary that research and development of a self-propelled ultrasonic rail inspection car is taken in hand.
- (iv) Considerable research and study is necessary to ascertain the limits of safe speed on turn-outs of varying degrees.

(Para 655)

(311) We have no doubt that expansion of the RDSO would be necessary so that the RDSO is able to play the role assigned to it.

(Para 656)

(312) We understand that the RDSO is in need of some very important equipment. We see no reason why the work in the RDSO should suffer for want of necessary equipment and would suggest that procurement of equipment should be planned so as to meet effectively the needs of the RDSO.

(Para 658)

(313) The increase in expenditure in the course of the next few years consequent on the expansion of the RDSO, would, in our view, be amply justified and would be repaid in the form of higher standard of earnings, efficiency, and safety in railway operation.

(Para 659)

(314) We strongly urge that foreign exchange needed for the expansion of the RDSO should be released as and when required.

(Para 660)

(315) It is our opinion that the reorganisation of the RDSO required to fulfil the role suggested in the foregoing paragraphs should be carried out within one year.

(Para 661)

(316) (i) For an organisation like the RDSO to be successful, there should be excellence not only at the top but at each echelon of the hierarchy and the effort should be to induct the most suitable officers and staff at all levels with suitable motivating environment.

(ii) It is obvious that the RDSO's rules of business and the yardsticks in respect of its staff, equipment and materials, financial powers, etc., may have to be different from those which are applicable ordinarily to the Railway administrations.

(Para 661)

(317) To ensure that there are no hold-ups or handicaps to progress anywhere in the organisation, the overall head of the RDSO should be the Chairman of the Railway Board to whom the Director General should report direct.

(Para 661)

(318) The Director General, who is the functional head should appropriately be selected from amongst the experienced General Managers with a flair for research.

(Para 661)

(319) We had suggested in Part I of our Report that the head of the RDSO should have a long enough tenure to make an impact on the organisation. If this involves a still higher grade for the post temporarily to enable the incumbent to continue, the upgrading would, in our view, be justified.

(Para 661)

CAPITER XV—Accident Statistics

(320) In order that statistics of train accidents may be of use, it is important that they should identify at least broadly, the primary causes of the various types of train accidents. Only then can the administration's attention get focussed on the various basic causes which give rise to accidents.

(Para 663)

(321) (i) We find that the statistics of train accidents as compiled in Statement 41 of the Supplement to the Annual Report on Indian Railways at present are oriented only towards their number and consequences.

(ii) A small pamphlet 'A Review of Accidents on Indian Railways' published annually attempts an elementary analysis of causes under certain broad heads in respect of collisions and derailments.

(Paras 663 and 665)

(322) While even broad heads of causes may have some value, the statistics of train accidents to be of intrinsic value should, in our opinion itemise these broad heads further so as to be of value to the administration.

(Para 666)

(323) We suggest that the accident statistics under different heads should be compiled on all the Railways on a uniform basis and instructions which leave no room for ambiguity should be issued to all the zonal Railways.

(Para 667)

(324) We suggest streamlining of the classification of accidents. For instance—

(i) Fires in diesel or electric engines are more in the nature of engine failures than accidents to trains, and a more accurate indication of the nature of such occurrence could be given if they were to be brought under the broad head 'failure of railway equipment'.

(ii) Fires in trains should, in our view, encompass cases of fires in vehicles and wagons only.

- (iii) It necessary, fires in electric and diesel locomotives may be brought under a separate sub-head under the general head 'engine failures' to isolate them from the mass of figures included under 'engine failures'.
- (iv) Time failures of engines under the broad head 'failure of railway equipment' are reckoned on the basis of delays of one hour or more caused to trains due to malfunctioning of train engines. While such standards may have been all right for steam traction years ago, we consider them inapt in the present day conditions, particularly in case of diesel and electric locomotives whose efficiency index must be very different, and for which a much shorter duration should, in our view, be prescribed.
- (v) We notice that at present 'failure of railway equipment' includes only failures of rolling stock, permanent way and overhead electric wires. Failures of signalling apparatus are not included under this head. A breakdown of signalling installations can cause heavy delays in train running if not a complete stoppage of movement. We therefore suggest that a breakdown of modern signalling installations or means of communication may also be classified under the head 'failure of railway equipment'.

(Paras 668 and 670)

- (325) We consider that accident statistics compiled at any time should be examined periodically to assess their value.

(Para 671)

CHAPTER XVI—Safety Organisation

- (326) The four important departments concerned with safety of rail travel are the operating, the mechanical engineering, the civil engineering and the signal engineering departments. In order that rail travel may be safe, it is necessary that each department should do its bit in the best possible manner.

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(Para 674)

- (327) It would be seen that there has been a fall of 44 per cent in the number of train accidents during the last six years and the number during the latest year was the lowest. For this satisfactory performance the credit must go not only to the safety organisation but to all categories of railway staff including officers, supervisors and railwaymen of all departments as well as the technological aids introduced. Nonetheless, it is clear that the safety organisation has played a vital role in enhancing the element of safety in rail travel by instilling safety consciousness amongst staff and eradicating short-cut methods which jeopardise safety.

(Para 682)

- (328) (i) We are of the view that the Directorate of Safety has a useful function to perform inasmuch as it focusses attention at the highest level on matters having a bearing on safety.

- (ii) Analyses of long-term trends of accidents, examination of various suggestions and recommendations to promote safety and following up the implementation of the recommendations coupled with on-the-spot checks to see whether short-cut methods are being adopted and how these can be eschewed are, indeed, highly useful functions. We, therefore, consider that the Directorate of Safety should continue to perform these functions as a permanent measure.

(iii) We are disappointed to note that the post of Joint Director in the Directorate of Safety was abolished some time ago for reasons of economy. The main objective of having a Joint Director in addition to a Director was that at all times the Director or the Joint Director could go out on inspection and be able to see through field inspections that safety work is carried on by the Railways on the right lines.

(iv) We consider this objective unexceptionable and would strongly recommend that the post of the Joint Director in the Safety Directorate should be revived. Considerations of economy should not, in our opinion, stand in the way where safety is concerned.

(Para 684)

(329) The Transportation Superintendent (Safety) should spend a good deal of his time in inspection from a safety angle. At the same time we think that to keep in touch with the actual trend in accidents and other safety measures which are evolved from time to time either on the basis of accident inquiries or of other sources, he should not be isolated from case work dealing with accidents.

(Para 685)

(330) We suggest that the headquarters safety organisation which is headed by a Transportation Superintendent (Safety) may be strengthened by the appointment, where required, of an officer in the senior scale who would help the Transportation Superintendent (Safety) both in inspections as also in routine case work dealing with accidents.

(Para 685)

(331) We are of the opinion that the Divisional Safety Officer in each of the Divisions should be in the senior scale. Wherever the post is held at present by an assistant officer, it should be upgraded.

(Para 687)

(332) (i) As safety must be built into the various departments of the organisation itself and particularly in the departments mainly concerned with movement of trains, we are of the view that Safety Counsellors of departments other than transportation should be sent back to their parent departments. On being sent back to their parent departments, these Counsellors should continue to carry on their present functions though under the supervision of their respective divisional officers.

(Para 690)

(333) (i) We suggest for the consideration of the Railway administrations that when Safety Counsellors are reverted to their parent departments, posts of Chief Permanent Way Inspector, Chief Loco Inspector, Chief Carriage and Wagon Inspector and Chief Transportation Inspector should be created in lieu of the existing posts of Safety Counsellors on each Division.

(ii) The functions of these Chief Inspectors should be to carry on the work of safety by educating the staff in correct methods of working, propagating the importance of safety by mass communication methods and reporting to their divisional heads about any defects found by them during the course of their checks on the line which jeopardise safety. These posts, in our view, should be in Class II. We consider that in the selection of such Chief Inspectors, their aptitude, sense of mission and dedication to the cause of safety should be the primary considerations and they should be hand-picked men.

(iii) The Chief Inspectors should concentrate on personal contact with the staff whom they are required to guide and train in safety measures. One aspect of their approach should be the importance which the staff should attach to their own personal safety.

(Para 691)

(334) (i) We understand that safety camps which had proved to be useful were given up some time ago. We would urge that these short safety camps should be revived.

(ii) These safety camps should not be confused with the regular refresher courses as safety camps are not intended to deal with routine rules and procedure. Their objective is to invigorate the safety consciousness of the staff.

(Para 694)

(335) We like to make a mention here of a highly enterprising effort made by the Divisional Superintendent and his officers at Lucknow in making a 'safety model car' which we had opportunity to see. We were impressed by the initiative of the Divisional Superintendent and his officers and would recommend that other divisions of the Railways may also adopt similar imaginative methods.

(Para 695)

(336) (i) A majority of the fatalities to railway staff are understood to occur to those railwaymen whose work exposes them to the danger of being struck down by trains or by other moving vehicles in yards. In order to deal with this the Railways in the United Kingdom have devised high visibility clothing in the form of short highly visible jackets to be worn over the normal clothing so that the men on or near the track are more easily seen by drivers of approaching trains both during day and night.

(ii) We recommend that this device in an appropriate form be introduced on the Indian Railways for the safety of railwaymen.

(Para 697)

(337) (i) We warn against the inspections of supervisors and officers in the safety organisation becoming routine inspections like those of other departmental supervisors or departmental officers.

(ii) Inspections and spot checks by those in the safety organisation should be devoted solely to highlight unsafe methods of working and how they can be eschewed without undue detriment to speedy movement of traffic.

(Para 698)

Acknowledgements

700. The Railway Board had directed the Railway administrations to give all possible assistance to the Committee in its inquiry and deliberations and had desired that the officers and staff should express their views candidly and in a forthright manner before the Committee. The Railway administrations in turn furnished the information called for by the Committee in the manner required of them. We readily acknowledge the co-operation received from both the Railway Board and the Railway administrations. We are grateful to the General Managers and other officers of the Railway administrations who showed us the utmost courtesy and attention during the course of our tours on the Railways.

701. We also wish to express our indebtedness to the retired Chairman and Members of the Railway Board and other senior officers who agreed to spare time for us and gave us their valuable and mature advice.

702. Our thanks are also due to the Additional Commissioners of Railway Safety for the information furnished and for the frank expression of their views and to Secretary, Ministry of Tourism and Civil Aviation and the Director General, Supplies and Disposals for having given us the benefit of their views. The Director, Central Bureau of Investigation, New Delhi was good enough to depute one of his senior officers to elucidate certain points for the benefit of the Committee and for this we feel grateful. We also wish to record our appreciation of the assistance given to us by the Chairmen of the Railway Service Commissions and of the opportunity which they gave us to discuss with them matters to which we attach importance.

703. Finally we would like to pay a tribute to the Committee's Secretary, Shri K.D. Madan for his conscientious labours which made it possible for us to conclude our work within seventeen months. He worked hard to ensure that the Committee's work went on smoothly and showed a high degree of initiative, ability and tact in carrying out his onerous responsibilities. In this task he was assisted ably by Shri S.P. Sethi, Transportation Inspector.

704. The Section Officer, the other Inspectors and the staff attached to the Committee coped ably with the formidable work involved in processing the data received by the Committee and analysing the evidence collected. They worked ungrudgingly for long hours often under adverse

conditions. In particular, we would like to commend the unremitting efforts of the personal assistants and stenographers attached to the Committee which enabled it to complete its job in time. We greatly appreciate their diligence and devotion.

(K. N. WANCHOO)
Chairman

(M. R. MASANI), M.P.
Member



(S. R. VASAVADA), M.P.
Member

(F. C. BADHWAR)
Member

(P. B. AIBARA)
Member

(K. D. MADAN)
Secretary
NEW DELHI
26th August, 1969.

ANNEXURE I

*Statement showing the details of cases of individual staff and matters of
Statement showing the details of cases of individual staff and matters of
six months of 1968-69 (upto 30-9-1968)*

Nature of Activities	Central		Eastern		Northern		North Eastern	
	67-68	68-69	67-68	68-69	67-68	68-69	67-68	68-69
1. Total numbers of individual cases of all categories of staff sponsored by the Trade Unions regarding								
(a) Transfers ..	197	122	507	318	1614	712	24	14
(b) Promotions ..	151	57	418	231	417	263	43	39
(c) Selections ..	64	32	215	110	96	42	29	10
(d) Punishments ..								
(i) for Accidents ..	6	2	97	54	94	21		
(ii) Other cases ..	49	17	306	180	616	447	9	12
(e) Leave ..	82	44	205	117	676	378	16	7
(f) Increments, Pay, Allowances and other payments ..	3,801	2,086	2,527	1,140	7,891	3,398	287	202
(g) Other cases ..	2,343	1,210	1,904	855	2,937	1,122	227	185
Total ..	6,693	3,570	6,179	3,005	14,341	6,383	634	409
2. Total number of cases on policy matters sponsored by Trade Unions								
1,029	506	1,551	535	1,304	469	134	96	
3. Grand Total ..	7,722	4,076	7,730	3,540	15,645	6,862	768	564
4. Percentage of item 1 to 3 ..	86.7	87.6	79.9	84.9	91.7	93.2	82.6	83.2
5. Percentage of item 2 to 3 ..	13.3	12.4	20.1	15.1	8.3	6.8	17.4	16.8

Nature of Activities	Northeast Frontier		Southern		South Central	
	67-68	68-69	67-68	68-69	67-68	68-69
1. Total numbers of individual cases of all categories of staff sponsored by the Trade Unions regarding						
(a) Transfers ..	98	33	227	91	93	46
(b) Promotions ..	62	29	190	93	82	43
(c) Selections ..	34	12	32	16	6	4
(d) Punishments ..						
(i) for Accidents ..	9	3	1	..	8	7
(ii) Other cases ..	43	11	74	28	285	79
(e) Leave ..	44	16	226	97	7	9
(f) Increments, Pay, Allowances and other payments ..	917	389	1,864	1,272	1,282	600
(g) Other cases ..	392	193	681	323	..	3
Total ..	1,599	686	3,295	1,920	1,763	790
2. Total number of cases on policy matters sponsored by Trade Unions						
131	93	1,195	557	319	133	
3. Grand Total ..	1,730	779	4,490	2,477	2,082	923
4. Percentage of item 1 to 3 ..	92.5	88.1	73.4	77.5	84.7	85.6
5. Percentage of item 2 to 3 ..	7.5	11.9	26.6	22.5	15.3	14.4

ANNEXURE I—contd.

Nature of Activities	South Eastern		Western		Total all Railways	
	67-68	68-69	67-68	68-69	67-68	68-69
1. Total number of individual cases of all categories of staff sponsored by the Trade Unions regarding						
(a) Transfers ..	241	136	151	58	3,152	530
(b) Promotions ..	312	181	28	23	1,703	959
(c) Selections ..	43	22	19	4	538	252
(d) Punishments						
(i) For accidents ..	9	6	1	..	225	93
(ii) Other cases ..	37	14	4	7	1,423	795
(e) Leave	92	67	5	..	1,352	735
(f) Increments, Pay, Allowances and other payments ..	1,619	828	73	37	20,261	9,952
(g) Other cases ..	2,832	1,407	195	83	11,511	5,380
Total ..	5,185	2,661	475	212	40,165	19,696
2. Total number of cases on policy matters sponsored by Trade Unions ..						
3. Grand Total ..	890	394	933	548	7,486	3,330
4. Percentage of item 1 to 3	85.3	87.1	38.8	27.9	84.3	85.4
5. Percentage of item 2 to 3	14.7	12.9	66.2	72.1	15.7	14.5

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ANNEXURE II
Instances of grievances of station staff brought up by the Trade Unions and their redress during 1967-68 and first six months of 1968-69 (upto 30th September 1968)

Railways	Year	Total No. of staff including Leave Reserves	Grievances relating to			Sanctioning of Increments or pay or Seniority or Promotion	Payment of arrears of Pay, Allowances etc.	Sanctioning of Provident Fund Loans	Granting of Leave								
			Confirmation or fixation of pay or Seniority or Promotion		%												
			A	B	%												
Central	1967-68	22165	94	87	92.55	234	202	86.32	552	375	67.93	93	33	35.49	23	16	69.57
	1968-69	22165	65	43	78.78	233	213	91.42	350	290	82.86	125	43	34.40	16	6	37.60
Eastern	1967-68	19059	238	237	99.58	170	165	97.06	296	283	95.54	50	100	100.00	43	42	97.67
	1968-69	16630	130	121	93.08	56	53	94.64	108	90	88.86	19	19	100.00	30	30	100.00
Northern	1967-68	19144	151	118	78.14	167	162	97.01	1456	985	86.07	15	14	93.38	35	32	91.43
	1968-69	19072	55	39	70.99	111	103	92.79	720	613	85.14	6	6	100.00	14	14	100.00
North- Western	1967-68	8376	50	47	94.00	11	10	90.98	53	46	86.79	..	..	..	..	..	..
	1968-69	8576	14	9	64.20	6	4	80.00	12	9	75.00	..	..	..	..	..	..
North- East	1967-68	7892	25	14	56.00	12	8	66.67	42	13	30.95	..	..	..	4	3	75.00
Frontier	1968-69	7882	21	9	42.86	10	5	50.00	34	10	29.41	..	..	..	3	2	66.67
North- Eastern	1967-68	15638	164	147	89.63	288	219	76.04	1,032	770	74.61	53	40	75.47	82	78	95.12
	1968-69	15667	93	87	93.55	216	158	73.15	914	837	91.58	12	11	91.67	65	57	87.70
South Central	1967-68	10380	29	22	75.86	74	74	100.00	157	17	100.00	2	2	100.00	4	4	100.00
	1968-69	10293	29	20	68.97	37	37	100.00	144	141	97.92	1	1	100.00	2	..	..
South Eastern	1967-68	13538	184	166	90.22	253	225	88.43	769	688	89.47	93	83	89.25	46	42	91.00
	1968-69	13701	110	100	90.91	149	134	89.93	371	343	92.45	39	26	66.67	23	20	86.96
Western	1967-68	13636	12	11	91.67	1	1	100.00	13	12	92.31	..	..	..	..	..	..
	1968-69	13626	6	1	20.00	..	..	..	4	2	50.00	..	..	..	..	..	..
All Railways	1967-68	127318	947	849	89.85	1210	1068	88.10	4070	3839	82.04	306	232	72.55	237	217	91.56
	1968-69	127322	512	429	83.73	817	707	86.54	2657	2341	88.11	202	106	62.48	165	131	84.52

A—Number of representations received.

B—Number of representations found worthy of redress

%—Percentage of B to A.

ANNEXURE II—contd.

Railway	Year	Grievances relating to Issue of Passes and P.T.Os.						Sanctioning of Pension or payment of Pension or Provident Fund						Total	
		A	B	%	A	B	%	A	B	%	A	B	%	A	B
Central	1967-68	12	9	75.00	45	42	93.33	1,053	784	72.55					
	1968-69	3	1	33.34	47	45	95.75	828	641	77.32					
Eastern	1967-68	17	17	100.00	34	34	100.00	848	828	97.64					
	1968-69	26	25	96.15	28	28	100.00	397	372	93.70					
Northern	1967-68	5	5	100.00	13	13	100.00	1,542	1,359	86.84					
	1968-69	14	14	100.00	..	..	..	920	789	85.76					
North Eastern	1967-68	..	..	..	..	..	..	..	114	103	90.36				
	1968-69	..	..	..	..	..	..	..	32	23	71.88				
Northeast Frontier	1967-68	..	..	..	..	..	..	..	..	..	..
	1968-69	..	..	..	..	..	..	..	..	..	..
Southern	1967-68	52	43	82.69	15	14	93.33	1,696	1,311	77.76					
	1968-69	15	13	86.67	7	7	100.00	1,322	1,170	88.50					
South Central	1967-68	1	1	100.00	1	1	100.00	268	261	97.39					
	1968-69	..	..	..	..	3	3	100.00	216	202	93.52				
South Eastern	1967-68	36	35	97.22	20	19	95.00	1,401	1,258	89.79					
	1968-69	18	18	100.00	9	9	100.00	719	650	90.40					
Western	1967-68	1	1	100.00	1	1	100.00	28	26	92.86					
	1968-69	..	..	..	..	1	1	100.00	11	5	45.45				
All Railways	1937-68	124	111	98.39	129	124	96.12	7,023	5,928	84.41					
	1968-69	76	71	93.42	6	6	93	97.90	4,514	3,878	85.91				

A—Number of representations received.

B—Number of representations found meriting redress/redressed.

%—Percentage of B to A.

ANNEXURE III
Instances of grievances of driving staff brought up by the Trade Unions and their redress during 1967-68 and first six months of 1968-69 (upto 30th September 1968)

Railways	Year	Grievances relating to																	
		Total No. of staff including Leaves Reserves				Confirmation or fixation of pay or seniority or Promotion				Sanctioning of increments				Payment of arrears Pay, allowances, etc.			Sanctioning of Provident Fund Loans		
		A	B	%	A	B	%	A	B	%	A	B	%	A	B	%			
Central	..	1967-68	8,812	47	38	80-85	76	66	86-94	144	112	77-78	31	16*	48-39				
	1968-69	8,812	20	16	80-00	72	56	77-78	98	76	77-55	37	19	51-35					
Eastern	..	1967-68	13,790	268	262	97-76	280	247	95-00	361	349	98-68	94	91	96-81				
	1968-69	13,623	169	163	96-45	75	74	98-67	169	156	92-31	43	41	96-35					
Northern	..	1967-68	12,031	77	49	63-64	90	87	96-66	419	378	90-21	15	15	100-00				
	1968-69	12,216	23	19	82-61	71	66	92-96	299	238	79-50	7	7	100-00					
North Eastern	..	1967-68	4,071	28	27	96-43	12	11	91-67	28	25	88-29	..	..	..	
	1968-69	4,071	13	10	76-92	..	..	..	..	8	3	37-50	..	..	..	
Northeast Frontier	1967-68	3,617	9	4	44-44	7	4	57-14	16	11	68-75	..	..	..		
	1968-69	3,617	6	3	50-00	5	3	60-00	11	7	63-64	..	..	..		
Southern	..	1967-68	6,944	62	55	88-71	205	142	69-27	283	254	89-75	12	12	100-00				
	1968-69	7,080	32	27	84-38	76	50	68-79	164	132	80-49	7	7	100-00					
South Central	..	1967-68	6,063	14	8	57-14	53	33	100-00	72	72	100-00	..	..	..	
	1968-69	6,185	10	8	80-00	14	14	100-00	59	59	100-00	..	..	..		
South Eastern	..	1967-68	9,680	182	134	73-63	108	101	93-52	636	613	96-38	56	50	89-29				
	1968-69	9,422	79	63	79-75	77	68	88-31	320	317	96-06	24	16	66-67					
Western	..	1967-68	9,455	9	7	77-78	5	4	80-00			
	1968-69	9,455	7	..	..	..	..	..	..	..	..	..	..	..	..
All Railways	..	1967-68	74,353	696	594	83-91	791	691	87-36	1,934	1,818	92-57	208	183	87-98				
	1968-69	74,881	369	369	86-97	390	331	84-87	1,138	986	86-82	118	90	76-27					

A—Number of representations received.

B—Number of representations to and merit of redress/reddressed.

%—Percentage of B to A.

ANNEXURE III—*contd.*

Railways	Year	Grievances relating to						Sanctioning of Pension or payment of Pension or Provident Fund						Total					
		Granting of Leave			Issue of Passes and PTOs			A			B			% A			B		
		A	B	%	A	B	%	A	B	%	A	B	%	A	B	%	A	B	%
Central	1967-68	3	1	25.00	1	1	100.00	12	8	66.67	314	240	76.43	240	173	70.61	245	173	70.61
	1968-69	4	1	25.00	2	..	..	12	5	41.67	..	..	..	1,186	1,142	96.29	..	..	..
Eastern	1967-68	62	61	98.39	56	56	100.00	85	76	89.41	49	49	100.00	571	549	96.15	571	549	96.15
	1968-69	41	41	100.00	25	25	100.00	49	49	100.00	..	..	..	..	..	..	..	..	..
Northern	1967-68	6	5	83.34	..	..	..	6	6	100.00	..	..	..	613	540	88.09	613	540	88.09
	1968-69	4	4	100.00	4	4	100.00	2	2	100.00	..	..	..	410	340	82.93	410	340	82.93
North	1967-68	5	4	80.00	142	142	100.00	..	..	..	..	..	..	215	209	97.21	215	209	97.21
Eastern	1968-69	1	1	100.00	..	..	..	..	..	..	..	..	..	22	14	63.64	22	14	63.64
Northeast	1967-68	2	1	50.00	..	..	..	..	..	..	..	..	..	34	20	58.82	34	20	58.82
Frontier	1968-69	1	..	..	..	..	..	..	..	..	..	..	..	23	13	56.52	23	13	56.52
Southern	1967-68	18	17	94.44	11	11	100.00	9	9	100.00	..	..	..	600	500	83.34	600	500	83.34
	1968-69	13	13	100.00	7	7	100.00	3	3	100.00	..	..	..	302	239	79.14	302	239	79.14
South	1967-68	..	..	..	..	..	..	2	2	100.00	..	..	..	121	115	95.04	121	115	95.04
Central	1968-69	..	..	..	..	..	..	1	1	100.00	..	..	..	84	82	97.62	84	82	97.62
South	1967-68	11	9	81.82	5	5	100.00	18	16	88.89	..	..	..	1,016	928	91.34	1,016	928	91.34
Eastern	1968-69	7	6	85.71	12	9	75.00	8	8	100.00	..	..	..	537	487	90.69	537	487	90.69
Western	1967-68	..	..	..	..	..	..	..	..	..	..	..	..	14	11	78.5	14	11	78.5
	1968-69	..	..	..	..	..	..	..	..	..	..	..	..	7	..	..	7	..	..
All Railways	1967-68	107	97	90.65	215	215	100.00	132	117	88.64	4113	3705	90.08	4113	3705	90.08	4113	3705	90.08
	1968-69	71	66	93.00	50	45	90.00	75	68	90.67	2201	1897	86.19	2201	1897	86.19	2201	1897	86.19

A—Number of representations received.

B—Number of representations found meriting redress/redressed.

%—Percentage of B to A.

ANNEXURE IV

Analysis of expenditure on different types of signalling developments works

(Figures millions or rupees)

Items	1965-66		1966-67		1967-68	
	Budgeted	Actual	Budgeted	Actual	Budgeted	Actual
<i>Modern Signalling</i>						
(i) Track Circuiting ..	..	3.22	3.56	9.75	8.42	7.13
(ii) Route Relay interlocking ..	12.15	12.18	15.14	14.25	13.24	13.02
(iii) Colour light signalling ..	7.13	7.17	6.96	6.14	7.87	6.59
(iv) Centralised Traffic Control ..	7.45	6.35	17.26	15.37	11.34	9.91
(v) Automatic Train Control ..	..	..	..	..	0.03	..
(vi) Automatic Block System ..	6.46	6.84	5.33	5.12	2.75	2.96
Total (i) to (vi) ..	36.41	36.10	54.44	49.30	42.46	39.29
(vii) Other Signalling Development Works ..	53.50	51.84	37.45	36.90	31.87	28.98
Total (i) to (vii) ..	89.91	87.94	91.89	86.20	74.33	68.97
(viii) Telecommunication ..	5.12	3.68	6.98	4.30	16.37	15.98
(ix) Grand Total ..	95.03	91.62	98.87	90.50	90.70	84.95

NOTE.—The figures in the table above do not include those for the South Eastern Railway as that Railway did not furnish the requisite details.

ANNEXURE V

Statement showing provision and year-wise programming of track circuiting of Block Stations on trunk routes, main lines and the branch lines

	On Trunk Routes			On Main Lines			On Branch Lines		
	B.G.	M.G.	Total	B.G.	M.G.	Total	B.G.	M.G.	Total
A. Total number of Block stations ..	1,189	463	1,652	922	951	1,873	1,093	1,270	2,363
B. (i) No. of Block stations provided with Track circuiting:									
(1) On all Passenger lines ..	159	120	279	93	15	108	21	12	33
(2) On main lines only ..	232	39	271	23	..	23	..	..	..
(ii) No. of block stations at which track circuiting work is in progress									
(1) On all passenger lines..	12	26	38	4	4	8	2	..	2
(2) On main lines only ..	136	..	135	6	..	6	..	..	..
(iii) No. of block stations at which track circuiting had not yet been undertaken but which are programmed for provision of track circuiting during :									
(a) 1968-69—									
(1) On all passengerlines ..	24	13	37	..	1	1	..	1	1
(2) On main lines only ..	38	20	58	6	..	6	..	..	..

ANNEXURE V—*contd.*

	On Trunk Routes			On Main Lines			On Branch Lines		
	B.G.	M.G.	Total	B.G.	M.G.	Total	B.G.	M.G.	Total
(b) 1969-70—									
(1) On all passenger lines ..	9	..	9	2	3	5	..	..	..
(2) On main lines only ..	161	22	183	..	..	..	..	..	..
(c) 1970-71—									
(1) On all passenger lines ..	22	..	22	..	..	..	..	..	..
(2) On main lines only ..	138	40	178	..	..	..	..	..	..
(d) 1971-72—									
(1) On all passenger lines ..	22	..	22	..	..	..	..	..	..
(2) On main lines only ..	138	40	178	..	..	..	..	..	..
(e) 1972-73—									
(1) On all passenger lines ..	22	..	22	..	..	..	..	..	..
(2) On main lines only ..	77	101	178	..	..	..	..	..	..
(iv) No. of Block stations to be provided with track circuiting but not yet programmed for it.									
(1) On all passenger lines ..	..	..	..	..	..	..	..	..	..
(2) On main lines only ..	..	42	42	..	..	..	..	..	..
Grand total of B(i) to (iv)—									
(1) On all passenger lines ..	270	159	429	90	23	122	23	13	36
(2) On main lines only ..	919	304	1223	35	..	35	..	..	..
	1189	463	1562	134	23	157	23	13	36

ANNEXURE VI

Statement showing the extent of interruption to control communication due to theft of copper wire

Serial No.	Railway	Control Circuit hours lost due to copper wire thefts and/or cable thefts	Number of circuits involved in thefts	Average Circuit hour lost per circuit effected
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During October to December 1967

1	Central 3,518 Hrs.	25 140	Hrs., 46 mts.
2	Eastern 4,400 Hrs.	31 141	Hrs., 53 mts.
3	Northern ..	.. 10,902 Hrs.	46 237	Hrs.
4	North Eastern ..	.. 5,264 Hrs., 12 mts.	24 219	Hrs., 20 mts.
5	Northeast Frontier ..	.. 588 Hrs.	15 39	Hrs., 16 mts.
6	Southern ..	.. 499 Hrs.	24 20	Hrs., 48 mts.
7	South Central ..	.. 1,457 Hrs., 15 mts.	16 991	Hrs., 1 mt.
8	South Eastern ..	.. 2,621 Hrs., 5 mts.	51 51	Hrs., 23 mts.
9	Western ..	.. 7,32 Hrs.	16 45	Hrs., 5 mts.

During October to December 1968

1	Central ..	.. 3,313 Hrs.	27 122	Hrs., 42 mts.
2	Eastern ..	.. 8,574 Hrs.	31 276	Hrs., 35 mts.
3	Northern ..	.. 10,888 Hrs.	42 269	Hrs., 24 mts.
4	North Eastern ..	.. 4,084 Hrs., 10 mts.	24 170	Hrs., 24 mts.
5	Northeast Frontier ..	.. 2,031 Hrs.	33 33	Hrs., 33 mts.
6	Southern ..	.. 832 Hrs.	17 48	Hrs., 56 mts.
7	South Central ..	.. 1,567 Hrs., 20 mts.	22 71	Hrs., 18 mts.
8	South Eastern ..	.. 5,385 Hrs., 50 mts.	596 596	Hrs., 12 mts.
9	Western ..	.. 1,168 Hrs.	28 42	Hrs., 50 mts.

ANNEXURE VII

Statement showing the incidence of coaches (bogies) marked sick for non-scheduled mechanical and electrical repairs at primary/secondary maintenance depot and at stations other than those during 1967-68 and first six months of 1968-69 (upto 30-9-1968)

Gauge	Types of coaches	Total number of coaches marked sick	Number of coaches marked sick		Coaches marked sick due to mechanical defects		Coaches marked sick due to electrical defects		
			At primary or secondary maintenance centres	At stations other than primary or secondary maintenance centres	Stations	Other terminal stations	Number	Percentage to total marked sick	
Broad Gauge	ICF	19,676	18,753	300	623	15,180	77.1	4,496	22.9
	BEML	12,984	11,951	354	659	11,060	85.3	1,904	14.7
	IRS	38,526	36,096	714	1,716	30,250	78.5	8,276	21.5
	Others	4,832	4,544	105	233	2,499	51.2	2,363	48.8
Total	..	76,048	71,344	1,473	3,231	58,989	77.6	17,059	22.4
Metro Gauge	ICF	5,578	5,430	75	73	4,801	86.1	777	13.9
	Jesops	22,084	20,332	726	1,026	20,167	91.3	1,917	8.7
	Other Steel bodied coaches	9,107	8,152	372	593	8,759	96.2	348	3.8
	Others	16,987	16,514	638	835	14,531	85.5	2,466	14.5
Total	..	53,756	49,428	1,811	2,517	48,258	89.8	5,498	10.2

Note—The Southern Railway furnished figures of coaches marked sick due to mechanical defects only but not those marked sick due to electrical defects. The figures of this Railway have not been included in this table.

ANNEXURE VIII

Statement showing the various mechanical defects for which the coaches (bogies) were marked sick during 1967-68 and first six months of 1968-69 (upto 30-9-68)

Gauge	Types of coaches	Wheel defects	Running gear defects i.e. (i) Axle box (including axle box spring)				Under frame defects	Body and other defects	Total				
			(ii) Brake gear		(iii) Bogie truck (including bolster arrangements, and								
(iv) Spring gear		A		B		A		B		A		B	
Broad Gauge ..	ICF	4,543	24.6	8,163	44.2	763	4.1	4,994	27.1	18,463			
BEMIL		1,636	12.0	9,489	69.5	383	2.8	2,138	16.7	13,646			
IRS		4,835	14.4	18,339	54.5	965	2.9	9,509	28.2	33,648			
Others		366	9.6	1,976	51.7	150	3.9	1,323	34.8	3,820			
Total ..		11,380	16.4	37,967	54.5	2,361	3.3	17,969	25.8	69,577			
Metre Gauge ..	ICF	932	15.1	3,964	64.2	241	3.9	1,034	16.8	6,161			
Jessops		3,167	15.1	14,596	69.4	489	2.3	2,757	13.2	21,009			
Other Steel bodied coaches		1,596	15.1	6,315	60.1	331	3.2	2,267	21.6	10,509			
Others		3,537	19.8	9,911	55.4	538	3.0	3,903	21.8	17,889			
Total		9,232	16.6	34,776	62.8	1,599	2.6	9,961	18.0	55,568			

A—Number of coaches marked 'sick'.

B—Percentage of coaches marked 'sick' to the total number of such coaches.

ANNEXURE IX
Statement showing position in respect of execution of ten selected modifications to carriage and wagon component by the Railways

Serial No.	Nature of modifications	Authority of modification Authority Date orders issued	Total number of coaches/wagons on which modification was required to be done	Total number of coaches/wagons on which modification was required to be done	Percentage of coaches/wagons on which modification was required to be done	Remarks
1	Replacement of leg type Axle guards by Pressed Steel Axle guards on broad gauge wagons	Railway Board	28,722	28,722 wagons	8,106 wagons	28·2
2	Replacement of headless pins by standard type of pins with cotter in the brakegear of ICF coaches broad gauge	RDSO 1-5-67	29,457	3,906 coaches	2,986 coaches	76·4
3	Replacement of headless pins by standard type of pins with cotters in the brakes.. gear of ICF coaches metrogauge.	Do.	1,468	Do.	1,432	Do.
4	Replacement of headless pins by standard type of pins with cotters in the brake-gear of BEML coaches broad gauge.	Do.	Do.	2,633	Do.	1,838 Do.
5	Fitment of Safety Brackets on the Equalising Beams on IRS coaches	Do. 1st: 1961 2nd: 1968 Sd: 13-3-69	7,519	Do.	1,592	Do.
6	Provision of Safety Straps to prevent Equalising stay from dropping and hitting the track in case of failure or working out of the pin on ICF coaches broad gauge.	ICF	22,9-66	1,845	Do.	892 Do.
						4B-3 The South Central Railway did not receive instructions for this modification.

ANNEXURE IX—*contd.*

Serial No.	Nature of modifications	Authority of modification Authority Date orders issued	Total number of coaches/wagons on which modification was required to be done	Total number of coaches/wagons on which modification was yet to be carried out	Percentage of coaches/wagons on which modification is yet to be carried out	Remarks
7	Replacement /repositioning of defective vacuum reservoir suspensions straps on ICF coaches broad gauge.	ICF	6-12-67	3,546 coaches	2,125 coaches	59.9 The South Central Railway did not receive instructions for this modification.
8	Provision of liberal fillet radius on Bolster swing links of BEML coaches broad gauge to prevent failures .	RDSO 1st: 17.11.64 2nd: 24.7.67	2,633	Do.	900	Do.
9	Provision of modified Safety Straps on Axle box guides and Bogie Bolster arrangements on all coil bogies of ICF coaches broad and metre gauges to obtain extra clearance and to avoid binding of Safety Straps on Axle box lugs and Bogie Bolsters.	ICF	23-3-68	3,281	Do.	3,214 Do.
10	Provision of Safety chains to 'BENI' and 'Stones' 60 ampere dynamos on ICF coaches metre gauge.	ICF RDSO Railway Board	9.9-65 28-1-69 4-2-69	1,001	Do.	471 Do.
						47.0 The Northeast Frontier Railway did not receive the instructions for this modification.

ANNEXURE X

Statement showing progress of implementation of the recommendations of the Director (Hot Boxes) contained in Special Investigation Report (1966)

Item No.	Recommendation	Board's decision and progress of implementation
51	Roller burnishing of plain bearing journals is far more satisfactory than finishing them with a grinding operation and hence finishing of such journals on grinding machines should not normally be permitted.	<i>Recommendation accepted. Implemented in Eastern, Northern, Southern and Western Railways. All procurements both on replacement and additional accounts are of roller burnishing machine and not grinding machine. It may be mentioned that these are not made in the country and have to be imported.</i>
61	The adoption of Foam Rubber lubricating pads having been approved by C. & W. Standard Committee, steps should be taken to set up indigenous capacity as early as possible.	<i>Accepted. Development orders on two firms at Faridabad and Calcutta have been issued for conducting large scale field trials before these are finally adopted by the Railways.</i>
62	The limited trials carried out so far with the light axle oil have shown promise and it is therefore recommended that further large scale trials be carried out while simultaneously examining the availability and the price factors of the light grade axle oil.	<i>Accepted. Trial programme is under preparation by RDSO/Lucknow. Action has already been initiated for procurement of light grade oil.</i>
65	Fitmen of rubber gaskets with the axle box face plates having already been approved should be expedited.	<i>Accepted. Railways have already placed indent for the gaskets on D.G.S. and D. and these will be fitted as soon as supplies are received.</i>
66	Use of semi-tubular rivets for securing the axle box face plates having already been approved should be implemented as early as possible.	<i>Accepted. One year's requirements of semi-tubular rivets have been worked out and the Stores Directorate has been asked to arrange procurement.</i>
75	It is recommended that further trials may be conducted after carrying out minor modifications to a more lasting type of skid which was being developed on the lines of a standard skid used on German Federal Railways.	<i>Accepted. Implemented by all the Railways.</i>
76	It will be necessary to closely follow up the development of the required manufacturing capacity for the important new items such as lubricating pads, sturdier axle box face plates, semi-tubular rivets for face plates, face plate gaskets, superior type rear dust shields, the proposed modified axle boxes and some improved type of axle guards in order to bring out axle box assembly in line with better designed units which are now in use in other countries.	<p><i>Accepted.</i></p> <ul style="list-style-type: none"> (i) <i>Lubricating pads</i>—Remarks are same as against item 61. (ii) <i>Sturdier axle box face plates</i>—While the trade enquiries made earlier were not very encouraging Eastern Railway at the moment are engaged in procurement of this item for trial according to the scheme which is being finalised by RDSO. (iii) <i>Semi-tubular rivets, gaskets</i>—Remarks are same as against item 66 and item 65. (iv) <i>Modified axle box</i>—An experimental order to prove feasibility of manufacture with in a reasonable cost has been placed with the CLW/Chittaranjan.

Item No.	Recommendation	Board's and progress of imple- mentation
	(v) <i>Face plate gasket</i> —Railways have placed indentures on D.G. S. and D. The progress is being watched.	
	(vi) <i>Dust Shield</i> —Two J.N.R. type reinforced neoprene rubber dust shields were put into trial and result showed that they were superior to those made of leather. Development of these items could not be progressed further due to high prices quoted by indigenous firms involving large element of foreign Exchange. However, further field trial will be conducted when conditions permit.	
	(vii) <i>Axle guard</i> —The question of failures on the pressed steel axle guards was considered in the 44th Carriage and Wagon Standards Committee meeting held in 1968 and certain modifications to the existing des gn were agreed to be carried on new builds as well as on the existing ones during POH to strengthen it and to prevent its failures.	
77	It is recommended that Indian Railways should also instal a few experimental electronic Hot Box detectors to gain experiance with this reliable device which may ultimately have to be adopted not merely for reducing the incident of Hot Box detachment but also in the vital interest of greater safety in train operation.	On account of very tight foreign exchange position and even otherwise it is too early to consider even a trial application of this expensive and intricate equipment.
79	There is immediate need for a substantial increase in the number of field engineers and senior supervisors to overcome the crisis of non-implementation of directives. Mere co-dification of the optimum repair and maintenance procedure will not do.	<i>Accepted.</i> Except in Eastern Railway where it has been implemented, this is under study by the Railways.
81	Many sicklines are in need of considerable improvements in respect of covered accommodation, pucca flooring in the working area, plant and equipment pit accommodation, layout, lighting for night working and supervisions.	<i>Accepted.</i> Necessary facilities are being provided by the Railways on planned basis.

ANNEXURE XI

Performance of D.G.S. & D. regarding coverage & supply against programme indents submitted by the Railways

Central Railway

(for 1966-67 requirements)						Percentage
No. of indents placed ..	..	..	..	..	..	101
No. of items ..	..	..	..	..	..	427
No. of items for which supplies were received in time fully ..	..	..	..	..	..	188
No. of items for which supplies were received partly ..	..	..	..	..	..	144
No. of items for which supplies delayed fully ..	..	..	..	..	..	95
No. of items for which supplies delayed partly ..	..	..	..	..	..	144
						23%
						32%

Delay in supplies categorised as under

	Fully	Partly	
		Items	Items
(1) Delay upto 3 months	27	20
(2) Delay between 3 to 6 months	14	30
(3) Delay between 6 to 12 months	35	28
(4) Delay over 12 months	19	66
Total	95	144

Eastern Railway

(For 1966-67 requirements)						Percentage
Items indented ..	..	..	..	..	..	52
Items covered in time as per D.G.S. & D.'s time table ..	..	..	..	..	..	15
Items covered late ..	..	..	..	..	..	37
Extent of delay ..	..	..	..	..	..	1 month to 11 months
Items where supplies were received in time as per D.G.S. & D.'s time table ..	..	..	..	..	..	Nil
Items where supplies were received after due date as per D.G.S. & D.'s time table ..	..	..	..	..	..	40
Items still outstanding on the date of report (30-8-68) ..	..	..	..	..	..	12
Extent of delay in receipt of supply ..	..	..	..	..	..	1 month to 18 months

Northern Railway

(For 1966-67 requirements)						
No. of items indented ..	..	..	..	..	..	465
No. of items covered by due date ..	..	..	..	..	..	290
No. of items covered after due date ..	..	..	..	..	..	115
No. of items cancelled ..	..	..	..	..	..	55
No. of items remained to be covered on 31-3-1967 ..	..	..	..	..	..	5
No. of items supplied by the required date ..	..	..	..	..	..	166
No. of items which were supplied on or after the required date ..	..	..	..	..	..	138
No. of items which remained to be supplied on 31-3-1967 ..	..	..	..	..	..	98
						30%
						20%

ANNEXURE XI—contd.

Northeast Frontier Railway

(For 1966-67 requirements)

						Percentage
Items indented	..	..	..	..	..	24
No. received in time	..	..	..	..	..	Nil
Items where supplies were received late	..	..	..	..	..	16 67%
No. still outstanding on date (June, 1968)	..	..	..	..	..	8 33%
Extent of delay	..	..	..	..	..	1 month to 15 months

Southern Railway

(For 1966-67 requirements)

						Percentage
Items indented	..	..	..	..	..	263
Supplies received in time	..	..	..	..	..	22
Supplies received after due date	..	..	..	..	..	222 84%
Items still outstanding for supply on the date of letter (14-8-68)	..	..	..	..	..	8 3%
Items cancelled	..	..	..	..	..	11
Extent of delay as per A/T delivery date	..	..	..	..	..	3 month to 20 months

South Central Railway

Items indented	..	..	..	..	..	234
Supply received in time in reference to delivery date as per A/T.	..	..	..	..	..	87
Supply received after due date	..	..	..	..	..	128 54%
Items still outstanding on the date of report (September, 1968)	..	..	..	..	..	19 8%
Extent of delay as per A/T delivery date	..	..	..	..	..	1 month to 12 months

South Eastern Railway

(Information available for "stock Items" only for which supplies were due in 1966-67).						
No. of indents placed	..	..	..	..	..	145
Items received by due date	..	..	..	..	..	34
Items received after due date	..	..	..	..	..	111 76%
Extent of delay	..	..	..	..	..	1½ month to 24 months

Western Railway

		During 1966-67	Percentage	During 1967-68	Percentage
No. of items indented	338	464	
No. of items covered in time	121 36%	231	50%
No. of items received within the delivery period stipulated in the A.Ts./Orders.	68 20%	167	36%

NOTE—The North Eastern Railway did not furnish the complete information.

ANNEXURE XII

List of equipment required by the RDSO in so far as consideration of safety are governed

IMMEDIATE REQUIREMENTS

S. No.	Description of equipment
--------	--------------------------

Civil Research—

1. Track Recording-cum-Research Car.
2. Pulsator with hydraulic jack, test bench etc. for fatigue testing.
3. Small items such as jacks, gauges of sorts, proving rings, strain indicators, calculating machines, small electrical registering machines, rail section profile machine etc.

Formation Engineering—

1. Equipment required for soil mechanics laboratory such as Triaxial equipment with pore water pressure device, vane shear apparatus, direct shear apparatus etc.

Mechanical Engineering—

1. Haulage device for impact test ramp.
2. Equipment required to develop measuring wheel and other telemetric devices.
3. Oscillograph trace assessor.

Signal and Telecommunication—

1. Measuring instruments required for Signalling and Telecommunications (118 in number).

Metallurgical and Chemical Engineering—

1. Krautkramers Ultrasonic rail tester—SZ-62 (2 Nos.) with spares.
2. Ultrasonic flaw detector USIP-10 or similar (2 Nos.) with spares.
3. Transistorised ultrasonic flaw detector (1 No.) with spares

REQUIREMENTS DURING THE NEXT FIVE YEARS

Civil Research—

1. Universal Testing Machine (Large capacity).

Formation Engineering—

1. Deep boring equipment.
2. Field test car BG for soil test equipment.
3. Field test car MG for soil testing equipment.
4. Automatic triaxial shear equipment with pore water pressure device electronically controlled.
5. Triaxial equipment with pore water pressure device.
6. Direct shear equipment with XY recorders.
7. Miscellaneous such as unconfined testing equipment with XY recorder etc.

ANNEXURE XII—*contd.*

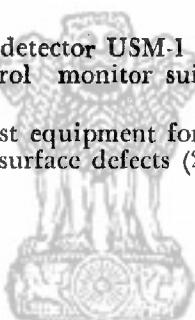
S. No.	Description of equipment
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Mechanical Engineering—

1. New oscillograph car (2 formations comprising of 3 vehicles).
2. Equipment like battery set, alternators, tool and plant for additional mechanical testing units.
3. Additional requirement of oscillograph car channels.
4. Ampex tape recorder with provision for multiplexing the trials.
5. Multi-channel intercom equipment for use during field trials.
6. Additional equipment such as data acquisition and data processing including telemetric devices.

Metallurgical and Chemical Engineering—

1. Krautkramers Ultrasonic rail tester SZ-62 (2 Nos.) with spares.
2. Ultrasonic flaw detector USM-1 (1 No.) with spares.
3. 3-channel control monitor suitable for rail trolley SZ-58 (1 No.).
4. Eddy current test equipment for high speed detection of surface and subsurface defects (2 Nos.).



APPENDIX

List of places and installations visited and persons interviewed by the Railway Accidents Inquiry Committee (1968)

Date	Place	Installation/office visited	S. No.	Person interviewed
9-9-68	Chandausi	Zonal Training School, Northern Railway.	1	Shri Swaran Singh, Principal
10-9-68	Lucknow	Research, Design and Standards Organisation.	2	Shri Laljee Singh, Additional Director Standards (Signal and Tele-communication).
			3	Shri T. V. Joseph, Director Research.
			4	Shri C. G. Devaya, Additional Director Standards (Carriage).
			5	Shri Dutt Kumar, Director Standards (Wagon).
			6	Shri T. C. Pant, Director Standards (Mechanical).
			7	Shri T. R. Vachha, Director General.
			8	Shri K. K. Rao, Director Standards (Civil).
			9	Shri S. K. Kanjilal, Director Standards (Electrical).
			10	Shri K. C. Choudhuri, Director (Met & Chem).
			11	Shri M. N. Mukherjee, Joint Director Standards (Traction).
			12	Shri Prabhinder Singh, Joint Director Research (Traffic).
12-9-68	Lucknow	Loco Workshop, Northern Railway.	13	Shri K. G. Uppal, Works Manager.
			14	Shri B. B. Kalia, Foreman (Erecting Shop)
			15	Shri N. N. Passi, Assistant Chief Inspector of Locos.
			16	Shri Jaswant Singh, Trial Inspector.
			17	Shri J. P. Gupta, Principal.
		System Technical School, Northern Railway.	18	Shri H. D. Bhalla, Works Manager.
		Carriage & Wagon Shop, Northern Railway.	19	Shri Manohar Lal, Carriage Foreman.
			20	Shri K. L. Sikka, Electrical Foreman.
			21	Shri B. N. Saini, Wagon Foreman.
			22	Shri Sat Pal, Neutral Examiner.
			23	Shri Gurbachan Singh, Train Examiner.
13-9-68	Lucknow	Carriage & Wagon Shop, Northern Railway.	24	Shri L. S. Gupta, Deputy Chief Mechanical Engineer (Works Shops).
		B. G. Loco Shed, Northern Railway.	25	Shri S. H. Mehndi, Loco Foreman.
			26	Shri Aminuddin, Driver.
			27	Shri Chetu Ram, Driver.
			28	Shri Mohd Hussain, Driver.
			29	Shri Mata Prashad, Fireman.
			30	Shri Bhawari Dass, Fitter.

APPENDIX—contd.

Date	Place	Installation/office visited	S.No.	Person interviewed
13-9-68	Lucknow	M. G. Loco Shed, North Eastern Railway.	31	Shri Mohd Samio Khan, Driver.
		Dilkusha Cabin B. G., Northern Railway.	32	Shri G. N. Sinha, Loco Foreman.
		M. G. Station Yard Cabin, North East- ern Railway.	33	Shri Mohiuddin, Fireman.
14-9-68	Lucknow	Divisional Office, Northern Railway.	34	Shri K. K. Khanna, Divisional Safety Officer.
			35	Shri D. N. Kohli, Divisional Mechanical Engineer.
			36	Shri Virendra Kumar, Divisional Engineer.
			37	Shri Prem Nath, Divisional Superintendent.
			38	Shri D. D. Srivastava, District Signal and Telecom Engineer, N. E. Railway.
			39	Shri S. Venkataraman, District Mechanical Engineer, N.E. Rly.
			40	Shri M. S. A. Rao, District En- gineer, N.E. Rly.
			41	Shri D. N. Kaushal, District Safety Officer, N. E. Rly.
			42	Shri Tameshwar Singh, Section Officer, GRP/Lucknow (Northern and North Eastern Railway).
26-9-68	New Delhi	..	43	Shri H. S. Hart, Additional Commissioner of Railway Safety, Southern Circle.
			44	Shri C. R. Sule, Additional Commissioner of Railway Safety, Northern Circle.
			45	Shri G. S. Pandor, Additional Commissioner of Railway Safety, North Eastern Circle.
			46	Shri Arya Bhushan, Additional Commissioner of Railway Safety, South Eastern Circle.
23-10-68	New Delhi	..	47	Shri B. D. Mehra, Director (Safety & Coaching), Railway Board.
			48	Shri S. M. Gowrishankar, Director, Signalling & Telecommunication Railway Board (Again on 28-4-69).
			49	Shri K. Vaidyanath, Director, Mechanical Engineering, Railway Board (Again on 29-4-69).
			50	Shri N. K. Mehra, Director Civil Engineering, Railway Board (Again on 29-4-69)
			51	Shri K. V. Kasturi Rangan Director, Establishment, Railway Board.
29-10-68	New Delhi	..	52	Shri R. C. Dutt, Secretary, Ministry of Tourism and Civil Aviation, Government of India.
5.12-68	Madras	Madras Central Cabin and EMU Car Shed, Southern Railway.	53	Shri Sinclair Lowe, Motorman.



APPENDIX—contd.

Date	Place	Installation/office visited	S. No.	Person interviewed
5-12-68	Madras	Madras Contra' Cabin and EMU Car Shed Southern Railway.	54	Shri C. Subramaniam, Motorman.
			55	Shri A. N. Narasimhan, Panel Operator.
			56	Shri C. T. Jayaraman, Assistant Signal Inspector.
			57	Shri D. Raghavan, Assistant Signal Inspector.
		Divisional Office, Southern Railway.	58	Shri A. S. Zacheus, Divisional Safety Officer.
			59	Shri B. L. Narway, Divisional Mechanical Engineer.
			60	Shri C. D. Srinivasan, Divisional Mechanical Engineer (C & W).
			61	Shri P. M. Joseph, Divisional Engineer.
			62	Shri S. N. Sultan Mahmood, Divisional Signal & Telecommunication Engineer.
			63	Shri A. S. Kasturi Rangan, Divisional Electrical Engineer.
			64	Shri T. V. Krishnaraju, Divisional Electrical Enginer (T&D).
			65	Shri T. M. Venkataraghavan, Assistant Electrical Engineer (G).
			66	Shri T. M. Thomas, Divisional Superintendent.
			67	Shri C. R. Basappa, Chairman, Railway Service Commission, Madras.
6-12-68	Madras	Headquarters Office, Southern Railway.	68	Shri T. Kamaleswaran, Chief Engineer.
			69	Shri E. B. McAuliffe, Chief Signal and Telecommunication Enggineer.
			70	Shri D.V.K. Sastri, Chief Electrical Engineer.
			71	Shri R. Parthasarathy, Controller of Stores.
			72	Shri G. N. Nair, Chief Personnel Officer.
			73	Shri K. Jankiraman, Transportation Superintendent (Safety).
7-12-68	Perambur	Integral Coach Factory.	74	Shri K. Santhanam, Chief Mechanical Engineer.
			75	Shri D.R.R. Sastri, Dy. Chief Mechanical Engineer.
			76	Shri T.K.A. Ayer, Works Manager.
			77	Shri Rakshit, Shop Superintendent.
			78	Shri Mahuddin, Chief Design Assistant.
	Madras	Headquarters Office, Southern Railway.	79	Shri E. S. Muthu Krishna, Chief Mechanical Engineer.
			80	Shri G. S. A. Saldanha, Chief Operating Superintendent.
			81	Shri V. T. Narayanan, General Manager.
8-12-68	Madurai	Loco Shed, Southern Railway.	82	Shri S. Baluswamy, Loco Foreman, Madurai.



APPENDIX—contd.

Date	Place	Installation/Office visited	S. No.	Person interviewed
8-12-68	Madurai	Loco Shed, Southern Railway.	83	Shri R. Khadir Baig, Assistant Loco Foreman, Madurai.
			84	Shri G. Stoddard, Retired Loco Inspector, Madurai.
			85	Shri A. Nyamath Ibrahim, Fitter Chargeman, Madurai.
			86	Shri Abdul Kareem, Driver 'A Grade, Madurai.
			87	Shri C.D. Costa, Engine Examiner, Madurai.
			88	Shri M. Palanisamy, Loco Fitter, Madurai.
		Divisional office, Southern Railway.	89	Shri N. Rajan Kutty, Divisional Safety Officer.
			90	Shri Venugopal, Safety Counsellor (Permanent Way).
			91	Shri Narayanaswamy, Safety Counsellor (Mechanical).
			92	Shri B. K. Damor, Divisional Mechanical Engineer.
			93	Shri C. Ghana Ratnam, Divisional Signal & Telecommunication Engineer.
			94	Shri M. J. Alexander, Divisional Electrical Engineer.
			95	Shri V. Kalyana Sundaran, Divisional Engineer.
			96	Shri S. G. Raman, Divisional Superintendent.
			97	Shri A. H. Madni Khan, Station Master, Cholapuram.
			98	Shri P. Thiruppatty, Cabinman Vilangudi.
9-12-68	Tiruchohirapalli	Loco, Carriage & Wagon Shops, Southern Railway.	99	Shri H. G. Venkatachallashetty, Works Manager, (Loco).
			100	Shri L. Gnanaamuthu, Works Manager (C & W).
			101	Shri G. Narayanan Potti, Dy. Chief Mechanical Engineer (Workshops).
		Zonal Training School, Southern Railway.	102	Shri K. S. Subramaniam, Superintendent.
			103	Shri C. V. B. Menon, Divisional Superintendent.
10-12-68	Bangalore	System Technical School, Southern Railway.	104	Shri K. Viswanathan, Principal

APPENDIX—contd.

Date	Place	Installation/ Office visited	S. No.	Person interviewed
10-12-68	Bangalore	System Technical School, Southern Railway.	105	Shri P. S. Sipathi, Train Examiner, Bangalore.
		International Instru- ments Private Ltd, Bangalore.	106	Shri K. V. Muthuswamy, Head Train Examiner (MG), Bangalore.
		Track Inspection from Guntakal to Hospet.		
12-12-68	Secunderabad	Secunderabad Sta- tion, South Cen- tral Railway.	107	Shri F. A. Sequira, Station Superintendent, Secunderabad.
			108	Shri Mohd. Ibrahim, Station Master, Maula Ali.
			109	Shri K. S. Raju, Guard, Secunderabad.
			110	Shri K. Sudarshan Rao, Guard, Kazipet.
			111	Shri P. Janki Ram, Traffic Inspector, Secunderabad.
			112	Shri N. S. Rodrigues, Sectional Traffic Inspector, Secunderabad.
			113	Shri V. B. Rajaratnam, Assistant Station Master, Lalleguda.
			114	Shri P. Venkata Rao, Cabin Assistant Station Master, Secunderabad.
			115	Shri G. Venkateshwarlu, Switchman, Tenali.
			116	Shri H. Michael, Signal Inspector, Shahabad.
			117	Shri C. K. Satyanarayana, Signal Inspector, Secunderabad.
			118	Shri V. Srinivasan, Assistant Signal Inspector, Secunderabad.
			119	Shri A. N. Dayakar Rao, Electric Signal Maintainer, Secunderabad.
			120	Shri Sattar Khan, Mechanical Signal Maintainer, Secunderabad.
			121	Shri V. T. V. Gunnswara Rao, Assistant Mechanical Signal Maintainer, Secunderabad.
13-12-68	Secunderabad	Signal Workshop, South Central Rail- way.	122	Shri M. Ananthanarayanaiah, Works Manager.
		Indian Railways School of Signal Engineering and Telecommunications.	123	Shri D. P. Purang, Principal.
			124	Shri J. O. Ribeyro, Divisional Safety Officer.
			125	Shri T. R. Pattabhiraman, Divisional Mechanical Engineer (Power).
			126	Shri K. Rajagopalan, Divisional Mechanical Engineer (C. & W).
			127	Shri M. Dinamani, Divisional Engineer.



सत्यमेव जयते

APPENDIX—contd.

Date	Place	Installation/Office visited	S. No.	Person interviewed
13-12-68	Secunderabad	Indian Railways School of Signal Engineering and Telecommunications	128	Shri H. P. Rama Rao, Divisional Signal & Telecommunication Engineer.
	Lallaguda C&W Workshop, South Central Railway.	129	Shri D. M. Convoyers, Divisional Electrical Engineer.	
	Headquarters office South Central Railway	130	Shri K. Srinivasacharyulu, Divisional Superintendent.	
		131	Shri I. K. Puri, Works Manager.	
14-12-68	Do.	Do.	132	Shri G. S. Rajan, Transportation Superintendent (Safety).
			133	Shri N. Hazra, Chief Engineer.
			134	Shri A. Lakshminarayanan, Chief Signal & Telecom Eng'neer.
			135	Shri M. Sundaresan, Controller of Stores.
			136	Shri V. Seetharaman, Chief Electrical Engineer.
			137	Shri N. S. Swaminathan, General Manager.
			138	Shri A. R. Sundara Rajan, Chief Personnel Officer.
			139	Shri H. R. Chopra, Chief Mechanical Engineer.
			140	Shri M. A. Uthappa, Chief Operating Superintendent.
15-12-68	Aurangabad	Track Inspection—Aurangabad to Manmad—South Central Railway.	141	Shri L. Lingesan, Assistant Engineer.
			142	Shri K. Seshaohalem, Permanent Way Inspector, Secunderabad.
			143	Shri A. K. Naidu, Permanent Way Inspector, Alir.
			144	Shri K. Malliah, Senior Permanent Way Inspector, Nekonda.
			145	Shri G. Narsimha Reddy, Assistant Permanent Way Inspector (MG) Guntakal.
30-12-68	New Delhi	Headquarters office—Northern Railway.	146	Shri D. B. Vohra, Transportation Superintendent (Safety).
			147	Shri B. D. Gaur, Chief Engineer.
			148	Shri P. C. Bhattacharyya, Chief Signalling & Telecom Engineer
			149	Shri A. Naudkeolyar, Deputy Chief Electrical Eng'neer.
			150	Shri V. S. Chopra, Chief Mechanical Engineer.
			151	Shri V. P. Sawhney, Chief Operating Superintendent.
			152	Shri G. Rai, Controller of Stores.
			153	Shri A. B. Lal, Chief Personnel Officer.
			154	Shri M. N. Bery, General Manager.
31-12-68	Tughlakabad New Delhi	Marshalling Yard—Northern Railway.	155	Shri G. D. Sharma, Head Train Examiner.
			156	Shri Som Dutt, Train Examiner.
			157	Shri M. M. Chakravarty, Neutral Train Examiner.

APPENDIX—contd.

Date	Place	Installation/Office visited	S. No.	Person interviewed
31-12-68	Tughlakabad, New Delhi	Marshalling Yard— Northern Railway	158	Shri Manohar Lall, Shunting Jamadar.
			159	Shri Charanjit Singh, Assistant Yard Master.
			160	Shri Guna Nand, Yard Foreman.
			161	Shri Vijay Kumar, Driver, Grade 'C'.
			162	Shri Karam Chand, Driver, Grade 'C'
			163	Shri Sant Lall, Fireman, Grade 'C'.
			164	Shri Gulshan Kumar, Fireman, Grade 'C'.
31-12-68	Delhi	.. Delhi Main Station, Northern Railway.	165	Shri Jagdish Chandra, Cabin Master.
			166	Shri O. P. Sohankar, Penal Operator.
			167	Shri N. Sardana, Block Inspector.
			168	Shri S. G. Gupta, Assistant Block Inspector.
			169	Shri P. L. Sharma, Electrical Signal Maintainer.
			170	Shri Islam Chand, Driver, Grade 'C'.
6-1-69	Jamalpur	.. Loco Workshops, Eastern Railway.	171	Shri C. N. Kapur, Deputy Chief Mechanical Engineer.
			172	Shri V. P. Chadha, Works Manager.
			173	Shri C. J. Gaudencio, Foreman Wheel Shop.
			174	Shri G. C. Mallick, Electrical Foreman.
			175	Shri B. K. Tiwari, Assistant Foreman, Smithy Shop.
			176	Shri I. C. Mondal, Assistant Fore- man, Fitting Shop.
			177	Shri S. R. Mookerjee, Loco In- spector.
			178	Shri B. B. Lall, Driver, Grade 'B'.
			179	Shri K. K. Neogi, Diesel Driver, Grade 'C'.
			180	Shri H. P. Bakshi, Permanent Way Inspector.
			181	Shri S. K. Paul, Permanent Way Inspector.
			182	Shri R. K. Dhara, Assistant Permanent Way Inspector.
			183	Shri M. Ganguli, Safety Counsellor (Traffic).
			184	Shri A. C. Chowdhury, Safety Counsellor (Loco).
			185	Shri A. N. Mukherjee, Safety Counsellor (P. Way).
			186	Shri P. K. Kundu, Safety Coun- sellor (C & W).
7-1-69	Indian Railways School of Mecha- nical and Electrical Engg.		187	Shri L. R. Gosain, Principal.
			188	Shri S. N. Chatterjee, Senior Assistant Professor.

APPENDIX—contd.

Date	Place	Installation/office visited	S.No.	Person interviewed
8-1-69	Chittaranjan	Chittaranjan Loco-motive Works.	189	Shri T. C. Chadha, Chief Mechanical Engineer.
			190	Shri C. Chakpati Rao, General Manager.
8-1-69	Andal	.. Marshalling Yard	191	Shri Pabitra Choudhury, Train Examiner.
			192	Shri N. K. Chakravorty, Neutral Train Examiner.
			193	Shri M. S. Gujral, Divisional Superintendent, Asansol.
9-1-69	Kharagpur	.. Carriage & Wagon Shops, South Eastern Railway.	194	Shri K. Prasad, Deputy Chief Mechanical Engineer, Work-shop.
			195	Shri R. K. Rau, Deputy Chief Mechanical Eng'neer(Deisels).
			196	Shri K. B. L. Wadhwa, Works Manager (Carriage).
			197	Shri B. Rangarajan, Works Manager (Wagon).
			198	Shri S. S. Nayak, Works Manager (Diesel).
			199	Shri K. P. Acharjee, Netural Train Examiner (Wagon).
			200	Shri S. K. Gangopadhyay, Neutral Train Examiner (Carr.age).
9-1-69	Kharagpur	Divisional Office, South Eastern Railway.	201	Shri G. H. Jagdale, Divisional Engineer.
			202	Shri N. Subramanian, Divisional Safety Officer.
			203	Shri Harnam Singh, Divisional Mechanical Engineer (Loco).
			204	Shri S. C. Das, Divisional Mechanical Engineer (C. & W.).
			205	Shri N. N. Dutta, Divisional Signal & Telecommunication Engineer.
			206	Shri H. L. Varma, Divisional Superintendent.
10-1-69	Puri	.. Sick Lines, Puri Station, South Eastern Railway.	207	Shri V. V. Subramaniam, Station Master, Puri.
			208	Shri K. V. Rao, Assistant Station Master, Sompeta.
			209	Shri D. N. Murthy, Guard Grade 'B', Khurda Road.
			210	Shri D. M. Rao Patnaik, Divisional Transportation Inspector.
			211	Shri P. N. Bewarta, Train Examiner, Khurda Road.
			212	Shri D. Raja Rao, Cabinman, Khurda Road.
			213	Shri Chand Narain, Divisional Superintendent, Khurda Road.
11-1-69	Calcutta	.. Headquarters office Eastern Railway.	214	Shri R. Jaganathan, Transportation Superintendent (Safety).
			215	Shri S. B. Zaheer, Chief Personnel Officer.
			216	Shri V. Parthasarathy, Chief Signal and Telecommunication Engineer.

APPENDIX—contd.

Date	Place	Installation/office visited	S. No.	Person interviewed
11-1-69	Calcutta	Headquarters office Eastern Railway.	217 218 219 220 221 222 223	Shri P. R. Mukerjee, Engineer-in-Chief (Traction). Shri N. Padmanabhan, Chief Electrical Engineer. Shri R. K. Tandon, Controller of Stores. Shri B. L. C. Sastri, Chief Operating Superintendent. Shri A. L. Kochhar, Chief Mechanical Engineer. Shri G. P. Warrier, General Manager. Shri P. C. Vaish, Chairman, Railway Service Commission, Calcutta.
12-1-69		Headquarters office South Eastern Railway.	224 225 226 227 228 229 230	Shri N. Dutt, Transportation Superintendent (Safety). Shri J. N. Roy, Chief Personnel Officer. Shri P. A. D'Souza, Chief Signal and Telecommunication Engineer. Shri S. P. Tonse, Chief Electrical Engineer. Shri A. K. Rao, Controller of Stores. Shri P. K. Ganguli, Chief Engineer. Shri K. L. Bery, Chief Mechanical Engineer.
13-1-69		M/s. Beni Ltd., Howrah.	231 232 233	Shri S. P. Chatterjee, Chief Operating Superintendent. Shri Jagjit Singh, General Manager. Shri K. K. Mukerjee, Retired General Manager, Eastern Railway.
14-1-69	Mughalsara	Humpyard, Eastern Railway.	234 235 236 237 238 239	Shri Shams-ul-Huq, Assistant Yard Foreman. Shri Mukhtar, Head Fitter. Shri M. N. Sinha, Assistant Station Master. Shri G. A. Singh, Assistant Yard Master. Shri Watan Singh, Train Examiner. Shri Rajeswari Singh, Train Examiner.
14-1-69	Varanasi	Diesel Locomotive Works.	240 241 242	Shri M. L. Puri, Chief Mechanical Engineer. Shri P. N. Mathur, General Manager. Shri K. Raman, Chief Design Engineer.
20-1-69	Ajmer	Loco Carriage and Wagon Shops, Western Railway.	243	Shri M. L. Khanna, Works Manager (C & W).

APPENDIX—contd.

Date	Place	Installation/office visited	S. No.	Person interviewed	
20-1-69	Ajmer	Loco Carriage and Wagon Shops, Western Railway.	244 245 246 247 248	Shri D. B. Singh, Works Manager (Loco). Shri S. K. Moitra, Deputy Chief Mechanical Engineer. Shri Framroz, Head Train Examiner. Shri N. D. Gandhi, Train Examiner. Shri Sher Singh Yadav, Train Examiner.	
21-1-69	Udaipur	Track Inspection—Chittorgarh to Udaipur City.	249 250 251 252 253 254 255 256 257 258	Zonal Training School Western Railway.	Shri H. N. Kidwai, Principal. Shri H. L. Ahuja, Permanent Way Inspector, Udaipur City. Shri R. K. Mehra, Permanent Way Inspector, Udaipur City. Shri P. M. Chavan, Assistant Permanent Way Inspector, Udaipur City. Shri Inder Kumar, Assistant Permanent Way Inspector, Phulad. Shri S. L. Khanna, Assistant Divisional Safety Officer, Ajmer Division. Shri J. N. Kapur, Divisional Mechanical Engineer, Ajmer Division. Shri L. S. Satyanarayana Rao, Divisional Engineer, Ajmer Division. Shri M. R. Haridas, Divisional Signal and Telecommunication Engineer, Ajmer Division. Shri H. I. Motianey, Divisional Superintendent, Ajmer Division.
24-1-69	Ahmedabad	Sabarmati Rail Welding Plant, Western Railway. Ahmedabad Station, Western Railway.	259 260 261 262 263 264 265	Shri G. C. Pandya Assistant Station Master, Vishwamitri. Shri S. N. Kalkar, Assistant Station Master, Asarva Jn. Shri Uma Shankar K. Trivedi, Guard Grade 'C', Ahmedabad. Shri S. R. Dass, Guard Grade 'C', Ahmedabad. Shri Maghanbhai Jama Bhai, Switchman, Anand Jn. Shri G. R. Sham Rao, Chief Signal Inspector, Ahmedabad. Shri Homi D. Segewala, Mechanical Signal Maintainer, Broach Jn.	

APPENDIX—contd.

Date	Place	Installation/office visited	S. No.	Person interviewed
31-1-69	Baroda	Railway Staff College Divisional Office Western Railway	266 267 268 269 270 271 272	Shri Rajendra Dev, Principal Shri S. G. Samant, Divisional Superintendent. Shri R. A. Agarwal, Divisional Safety Officer. Shri N. C. Sinha, Divisional Mechanical Engineer. Shri M. K. Kaul, Divisional Signal and Telecommunication Engineer. Shri J. N. Pendse, Divisional Engineer. Shri C. L. Chadda, Divisional Accounts Officer.
1-2-69	Bombay	Carriage and Wagon Workshops, Matunga, Central Railway.	273	Shri A. K. Sawhney, Work Manager.
		Bombay V.T. Cabin	274 275 276 277 278 279 280	Shri R. K. Tyagarajan, Deputy Chief Mechanical Engineer. Shri Y. S. Katre, Station Super- intendent, V.T. Shri T. S. Ghadge, Assistant Station Master, V.T. Shri D. N. Shenoy, Electrical Sig- nal Maintainer, Byoulla. Shri A. Patrick, Electrical Signal Maintainer, Kurla. Shri H. V. P. Sinha, Signal Ins- pector, Kurla.
		Headquarters office Cen- tral Railway, Bombay.	281 282 283 284 285 286 287 288	Shri V. K. Shrivastava, Divisional Safety Officer. Shri Cyril Christian, Divisional Electrical Engineer. Shri D. N. Rao, Divisional Mecha- nical Engineer. Shri N. Appukuttan, Divisional Engineer. Shri B. P. Mathur, Divisional Signal and Telecommunication Engineer. Shri P. V. Gole, Divisional Superintendent. Shri G. D. Tapase, Chairman, Railway Service Commission, Bombay. Shri K. Raghunathan, Foreman.
2-2-69	..	EMU Car Shed Bombay Central, Western Railway.	289 290 291 292 293 294	Shri C. Pereira, Motorman. Shri L. K. Israni, Motorman. Shri K. J. Narendra Singh, Transportation Superintendent (Safety). Shri T. S. Viswanathan, Chief Electrical Engineer. Shri Girdharadas, Chief Per- sonnel Officer. Shri V. C. Paranjape, Control of Stores.

सत्यमेव जयते

APPENDIX—contd.

Date	Place	Installation/ office visited	Serial No.	Person interviewed
3-2-69	Bombay	Headquarters Office, Western Railway.	295	Shri R. S. Mehta, Chief Signal & Telecommunication Eng- ineer.
			296	Shri M. J. Patel, Chief Engineer.
			297	Shri C. D. Mirchandaney, Chief Mechanical Engineer.
			298	Shri R. Sampath, Chief Operating Superintendent.
		Headquarters Office, Western Railway.	299	Shri G. S. Khosla, General Manager.
		Headquarters Office, Central Railway.	300	Shri H. V. Samuel, Transporta- tion Superintendent (Safety).
			301	Shri V. S. Gupta, Chief Electrical Engineer.
			302	Shri R. T. Shahani, Chief Per- sonnel Officer.
			303	Shri G. C. Basavraj, Controller of Stores.
4-2-69	Do.	Do.	304	Shri R. K. Dandekar, Chief Signal and Telecommunication Engineer.
			305	Shri Hari Sinha, Chief Engineer.
			306	Shri P. N. Khanna, Chief Me- chanical Engineer.
			307	Shri V. Ramanathan, Chief Operating Superintendent.
			308	Shri B. S. D. Baliga, General Manager.
3-2-69	Bhusawal	Zonal Training School, Central Railway.	309	Shri K. V. Pandit, Principal.
		Track Inspection from Bhusawal to Jalgaon.	310	Shri N. R. Naidu, Permanent Way Inspector, Pachora.
			311	Shri S. P. Joshi, Assistant Per- manent Way Inspector, Akola.
			312	Shri J. C. Pradhan, Sub-Per- manent Way Inspector, Dharwah-Motibagh.
7-2-69	New Delhi		313	Col. D. McMullen, Retired Chief Inspecting Officer of Railways, British Ministry of Transport, U. K. Again on 13-2-69 and 14-2-69.
19-2-69	Barauni	Garhara North Eastern Railway.	314	Shri B. N. Mallick, Assistant Station Master, Barauni.
			315	Shri P. K. Chakraborty, Assistant Yard Master, Garhara.
			316	Shri Thakur, Shunting Jamadar, Garhara.
			317	Shri Kailash, Shunting Jamadar Barauni.
			318	Shri V. N. Srivastava, Train Examiner, Chirpa.
			319	Shri J. N. Ghosh Dastidar, Train Examiner, Garhara.

APPENDIX—contd.

Date	Place	Installation/ office visited	Serial No.	Person interviewed
20-2-69	Darjeeling	Darjeeling Station Northeast Frontier Railway.	320	Shri G. B. Karmarkar, Pointsman, Siliguri.
			321	Shri Chander Bir, Chetri, Pilot- man, Darjeeling.
			322	Shri A. B. Roy, Assistant Traffic Inspector, Kurseong.
			323	Shri N. N. Dass, Station Master, Molda Town.
			324	Shri Bachan Parsad Gupta, Assistant Station Master, Kishenganj.
			325	Shri D. P. Mukerjee, Guard Grade 'A', Alipurduar Jn.
			326	Shri T. K. Nag, Guard, Grade 'C', Siliguri.
21-2-69	Alipurduar Jn. New Bongaigaon.	Zonal Training School, Northeast Frontier Railway. Loco Carriage & Wagon Shops, Northeast Front- tier Railway.	327	Shri B. C. Banerjee, Superinten- dent.
			328	Sardar Atma Singh, Works Manager
			329	Shri P. R. Jain, District Elec- trical Engineer.
22-2-69		Track Inspection from Lumding to Lower Haflong.		
23-2-69	Gauhati	Running Room and Ambulance Car, New Gauhati. Headquarters Office,	330	Shri R. K. Dass, Permanent Way Inspector, Bongaigaon.
		Northeast Frontier Railway.	331	Shri S. K. Chakraborty, Per- manent Way Inspector, Lum- ding.
			332	Shri A. K. Chanda, Assistant Permanent Way Inspector, Pandu.
			333	Shri A. K. Choudhary, Assistant Permanent Way Inspector, Kumedpur.
			334	Shri S. K. Gupta, District Safety Officer, Alipurduar.
			335	Shri A. D. Jog, District Signal and Telecommunication Engineer, Alipurduar.
			336	Shri G. Gray, District Mechanical Engineer, Alipurduar.
			337	Shri M. Sharma, District Engi- neer, Alipurduar.
			338	Shri C. S. Christian, Transpor- tation Superintendent (Safety).
			339	Shri V. U. Shenai, Chief Signal & Telecommunication Engineer.
			340	Shri D. G. Divgi, Chief Personnel Officer.

APPENDIX--contd.

Date	Place	Installation/ Office visited	Serial No.	Person interviewed
23-2-69	Gauhati	Headquarters Office, Northeast Frontier Railway.	341	Shri M. I. Chhaya, Chief Engi- neer.
			342	Shri S. S. Kochak, Chief Elec- trical Engineer.
			343	Shri V. N. Agharkar, Controller of Stores.
24-2-69			344	Shri D. K. Subbarwad, Chief Mechanical Engineer.
			345	Shri H. F. Pinto, Chief Opera- ting Superintendent.
			346	Shri H. M. Chatterjee, General Manager.
26-2-69	Gorakhpur	Loco, Carriage & Wagon Workshops, North Eastern Railway.	347	Shri K. A. Tikku, Works Manager (Loco).
			348	Shri C. M. Mani, Works Manager (C. & W.).
			349	Shri B. R. Pahwa, Deputy Chief Mechanical Engineer.
		Headquarters Office, North Eastern Railway.	350	Shri B. B. Singh, Permanent Way Inspector, Gorakhpur.
			351	Shri R. K. Sharma, Assistant Permanent Way Inspector, Badshahnagar.
			352	Shri B. Hana, Assistant Per- manent Way Inspector, Raft- nagar.
27-2-69	Gorakhpur	Centralised Traffic Control, North Eastern Railway.	353	Shri R. N. Sinha, Panel Operator.
			354	Shri S. K. Saxena, Panel Ope- rator.
			355	Shri V. P. Tripathi, Signal Inspector.
			356	Shri Dhanpat Prashad, Mecha- nical Signal Maintainer.
			357	Shri Mahatam Parsad, Electrical Signal Maintainer.
		Headquarters Office, North Eastern Railway.	358	Shri Ajit Rosha, Transportation Superintendent (Safety).
			359	Shri S. A. Srinivasan, Chief Signal & Tele-communication Engineer.
			360	Shri S. C. Chatterjee, Chief Personnel Officer.
			361	Shri U. H. Mehta, Chief Engineer.
			362	Shri S. N. Biswas, Controller of Stores.
			363	Shri M. M. Bam, Chief Mecha- nical Engineer.
			364	Shri A. K. Gupta, Chief Opera- ting Superintendent.
			365	Shri P. C. Mathew, General Manager.
10-3-69	New Delhi		366	Shri M. A. Rao, Retired Member Engineering, Railway Board.

APPENDIX—contd.

Date	Place	Installation/ Office visited	Serial No.	Person interviewed
10-3-69	New Delhi		367	Shri G. P. Bhalla, Retired Member Mechanical, Railway Board.
			368	Shri L. D. Panke } Representatives
			369	Dr. S.S.L. Verma } of Federation
			370	Shri R. Dayal } of Class I Rail-
			371	Shri J. N. Kohli } way Officers'
			372	Shri J. Rajagopalachari, Association.
			373	Shri F. DaCosta }
			374	Shri S. W. Shiveshwarkar, Director General (Vigilance), Railway Board.
11-3-69			375	Shri Kripal Singh, Retired Chairman, Railway Board.
			376	Shri K. C. Lal, Retired Additional Member Mechanical, Railway Board.
			377	Shri Rajadhynk-sha } Representatives
			378	Shri P. Subbra-miah, } of National Federation of Indian Rail-
			379	Shri K. H. Kul-karni, waymen.
			380	Shri P. M. Shukla,
			381	Shri H. L. Sharma }
12-3-69			382	Shri Harbans Singh, Retired Member Staff, Railway Board
			383	Shri A. K. Gupta, Retired Commissioner of Railway Safety
			384	Shri H. S. Chatterjee, } Representatives
			385	Shri A. C. Lahiri } of All India Station Masters' Association.
			386	Shri K. K. Pandit }
			387	Shri R. D. Dass-gupta, }
			388	Shri J. S. Bajwa }
			389	Shri H. B. Singh }
			390	Shri K. K. Pra-bhakaran, }
			391	Shri B. N. Bhargava, }
			392	Shri K. K. Bhatia }
13-3-69	New Delhi		393	Shri Joginder Singh } Representatives
			394	Shri S. L. Gupta } of Indian Railway Engineers' Association.
			395	Shri K. K. Manrai }
			396	Shri Tej Prakash, }
			397	Shri J. C. Sindhi }
			398	Shri Harchandan Singh, }
			399	Shri S. Bauerji }
			400	Shri J. N. Bhattacharjee, }
				Representatives of Indian Rly. Foremen Association and Technical Supervisors' Association.

APPENDIX—contd.

Date	Place	Installation/ Office visited	Serial No.	Persons interviewed
13-3-69	New Delhi		401	Shri D. C. Acharya.
			402	Shri D. R. Roy
			403	Shri S. K. Rajendra Babu
			404	Shri B. R. Kinra, Director Railway Stores, Railway Board.
14-4-69	Do.		405	Shri D. Sen, Additional Director, Central Bureau of Investigation, Govt. of India
15-4-69	Do.		406	Shri P. C. Bhagat, Director General, Supplies and Disposals, Govt. of India.
28-4-69	Do.		407	Shri K. K. Das, Director Security, Railway Board/I.G.R.P.F.
			408	Shri S. K. Singh, Scientific Officer, Psycho Technical Cell, Railway Board.

